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Vol. VI
TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 1940

No. 267

**SIX COMPANIES OF CALIFORNIA, HARTFORD
ACCIDENT AND INDEMNITY COMPANY, ET AL.,
PETITIONERS,**

vs.

**JOINT HIGHWAY DISTRICT No. 13 OF THE STATE
OF CALIFORNIA**

**ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT
OF APPEALS FOR THE NINTH CIRCUIT**

PETITION FOR CERTIORARI FILED JULY 22, 1940.

CERTIORARI GRANTED OCTOBER 14, 1940.

United States
Circuit Court of Appeals

For the Ninth Circuit.

SIX COMPANIES OF CALIFORNIA, a corporation, and
HARTFORD ACCIDENT AND INDEMNITY COMPANY,
a corporation, FIDELITY AND DEPOSIT COMPANY
OF MARYLAND, a corporation, THE AETNA CAS-
UALTY AND SURETY COMPANY, a corporation, IN-
DEMNITY INSURANCE COMPANY OF NORTH
AMERICA, a corporation, AMERICAN SURETY COM-
PANY OF NEW YORK, a corporation, MARYLAND
CASUALTY COMPANY, a corporation, UNITED
STATES FIDELITY AND GUARANTY COMPANY, a
corporation, THE FIDELITY AND CASUALTY COM-
PANY OF NEW YORK, a corporation, GLENS FALLS
INDEMNITY COMPANY, a corporation, STANDARD
SURETY AND CASUALTY COMPANY OF NEW YORK,
a corporation, STANDARD ACCIDENT INSURANCE
COMPANY, a corporation, MASSACHUSETTS BOND-
ING AND INSURANCE COMPANY, a corporation, CON-
TINENTAL CASUALTY COMPANY, a corporation, and
NEW AMSTERDAM CASUALTY COMPANY, a corpo-
ration,

Appellants,

vs.

JOINT HIGHWAY DISTRICT NO. 13 OF THE STATE OF
CALIFORNIA, a public corporation,

Appellee.

Transcript of Record

In Eight Volumes

VOLUME VI

Pages 1987 to 2368

Upon Appeal from the District Court of the United
States for the Northern District of California,
Southern Division.

DeLANCEY C. SMITH,

called by the plaintiff; sworn.

Direct Examination

Mr. Marrin: Q. Mr. Smith, when were you first employed as an attorney by Six Companies of California?

A. In March of 1935.

Q. Did you represent the Company in negotiations with the defendant District?

A. Yes, I did.

Q. In connection with your representation of the Company, did you have a conversation with Mr. Boggs, on April 3, 1935?

A. I had several conversations with Mr. Boggs at different times, and my notes show that one of them was on April 3rd.

Q. Where was that conversation held?

A. At the office of the District, in Mr. Boggs' private room.

Q. Who was present?

A. Mr. Boggs and myself.

Q. No one else? A. That is correct.

Q. What was said at that time?

Mr. Wittschen: Objected to as immaterial and calling for hearsay, and attempting to bind the District by statements which are not binding upon it.

Mr. Marrin: If the Court please, this is the same type of testimony that has been objected to before,

(Testimony of DeLancey C. Smith.)

and, if the Court please, our purpose in showing this is to show that the decision regarding [1624] the extension of time was not based on bona fide judgment of the Engineer. We have a case which is directly in point on the admissibility of this kind of testimony. It is the case of Mayor and City Council of Baltimore versus Ault, cited in 94 Atlantic, page 1044. In that case, there was a question of whether the decision of the engineer on the extension of time and the deduction of penalties was made in good faith; and the contract in that case contained a provision to the effect that to prevent disputes and litigation the harbor engineer shall in all cases determine the amount, quality and acceptability of the work which is to be paid for under the contract, and shall determine all questions in relation to the work, and the performance thereof, and shall in all cases decide every question which may arise relative to the fulfilment of the contract on the part of the contractor. His estimate and decision was to be final and conclusive; and in case any questions arise between the parties touching the contract, such estimate and decision shall be a condition precedent to the right of the contractor to receive any monies under the contract.

The Court will remember we have a very similar clause in this contract.

“Time Required.—Bidders must state the number of consecutive working days required to complete the work. A working day shall

(Testimony of DeLancey C. Smith.)

consist of eight hours of each and every day except Sundays and holidays as set aside by the national government, the Governor of Maryland, or the Mayor of Baltimore. If it is raining too hard at 8 a. m., in the judgment of the Engineer, to permit work, such day shall not constitute a working day. In computing the lapsed number of working days, no allowance for bad weather or other delays not covered by the preceding clause, will be made, unless claim for exemption has been made within 48 hours of the time the delay occurs. The Contractor must begin the work within 15 days [1625] after notice to do so, and must complete the work within the time specified. Should the Contractor fail to complete the work within the time specified, he shall forfeit to the City as liquidated damages, and not as a penalty, the sum of \$25 for each and every day which may elapse between the limiting date and the completion of the work."

Deductions were made because the contractor failed to complete the work. The Contractor contended it was impossible, without an extension of time, and the Engineer's decision was not made in good faith. In connection with that contention, the Court said:

"In the case now under consideration the specifications, in order to prevent disputes and

(Testimony of DeLancey C. Smith.)

litigations, provided that the harbor engineer 'shall determine all questions with relation to said work, and the performance thereof, and shall in all cases decide every question which may arise relative to the fulfillment of the contract on the part of the contractor.' One of the provisions of the contract to be fulfilled by the contractor was that the work was to be completed within 150 working days; and it is clear that the harbor engineer was authorized to decide whether that provision had been complied with, and, in doing so, to determine the number of days for which they were entitled to credit, in order to decide on how many working days they were engaged in the work. He could not, of course, deprive the city of the benefit of the stipulation in regard to liquidated damages, or withhold from the contractors credit for any delays for which they were not responsible. These rights were secured to the city and to them by the contract. But he was authorized to decide what delays the contractors were subjected to and the extent of those delays, otherwise he would be unable to decide whether the contractors had fulfilled the contract." [1626]

The Court then goes on to state his decision may be set aside for bad faith and no intent to defraud need be shown,—simply bad faith. In that connection, the Court says:

(Testimony of DeLancey C. Smith.)

"To constitute bad faith it is not necessary, however, that the decision of the person to whose judgment the matter is submitted shall be the result of a malicious and deliberate purpose to defraud or deprive a party to the agreement of the benefit of the contract. The agreement in this case was to submit the matters within the terms of the submission to the decision of the harbor engineer, and not to the judgment of any other person. His honest decision, however erroneous, would be binding upon the parties, because the contract makes it so, but nothing short of that would gratify the terms of the agreement, and any decision which was not his judgment, but the mere expression of his views, or the influence, whether intentionally or innocently exercised, of others, would be outside of the contract and without force."

Then the Court said, in reviewing the evidence:

"While it does not contain any evidence of collusion, corruption, or fraud on the part of the harbor engineer or other city officials, it was sufficient to go to the jury upon the question whether the estimate made by the harbor engineer of the number of working days the completion of the work was delayed was in fact his decision."

(Testimony of DeLancey C. Smith.)

Furthermore, the Court held that statements of the engineer on the question of delay were properly submitted. On page 1054 of the decision, the Court said:

“In the first, second, sixteenth, seventeenth, and eighteenth exceptions the witnesses were asked to state conversations they had with the harbor engineer. The evidence elicited by these questions was admissible as tending to show the opinion of the engineer as to the fact, extent, and causes of the delays claimed by the [1627] plaintiffs, and as reflecting upon the question whether his estimate of the number of working days the plaintiffs were engaged in the work was his decision of the matter.”

Now, our position here, if the Court please, is simply this: That the decision, turning us down on the extension of time, was not the decision of the Engineer at all; did not reflect his judgment, but was made because of the fact that the plaintiff in this case had presented claims for damage against the District, and it asked for an adjustment, and that the District did not grant the extension of time, perhaps because it feared, by admitting those claims, or for some other reason—but that we were entitled, regardless of any controversy or any claims existing between the parties, to the unbiased and honest judgment of the Engineer in this case as to whether we were entitled to an extension of time; that we

(Testimony of DeLancey C. Smith.)

did not get that honest and unbiased judgment; and we think we are entitled to show, by expressions made by the Engineer, that it was his opinion that we were entitled to an extension of time in this case, and that he did not exercise an unbiased, fair judgment, which is necessary to sustain a decision of any arbitrator or any engineer that has the powers conferred upon him by this contract; and it is for that purpose we offer this evidence.

Mr. Wittschen: It is not a question of the Engineer acting as an arbitrator. It is a question as to whether, in his opinion,—his honest, sincere judgment,—an extension of time should be recommended. The contract in this case provides an extension of time shall be made by the contracting parties, not by the Engineer; and you remember the clause that, where they were delayed by stormy or inclement weather, or any other matter which, in the opinion of the Engineer, produced delay on the work—I assume they would have a right to show that; and, if that is the purpose, if the [1628] Court please,—to show that the Engineer acted arbitrarily—in other words, I think that is within the issue. If that is the purpose,—to show they were arbitrary acts,—I take it I should not press the objection at this time.

Mr. Wittschen: Exception. [1629]

The Court: Q. You had a conversation with the engineer?

(Testimony of DeLancey C. Smith.)

A. I think the question was directed to the first conversation.

Mr. Marrin: Yes, the first conversation of April 3, 1935.

A. Yes, at that conversation it was principally a matter of my getting acquainted with Mr. Boggs; I had never met him before, and I called at his office for the purpose of getting acquainted with him, and advising him that I would be somewhat in touch with the performance of the contract from that date forward, and that we had several problems which we hoped to work out mutually with him as the engineer. I told him, for one thing, that I had not finished my examination of all the facts yet, but it did seem to me that the contractor was entitled to an extension of time, based on the rainy season which had delayed outside work, and based on difficulties which I understood had been encountered in handling the job at the west portal. We also discussed other matters which are not now here involved in this case. I told Mr. Boggs that if after a further investigation it seemed to me that the contractor was entitled to an extension of time I would like to file an application for such an extension, and he said in substance, in reply to that, that he did not think that it was advisable for the contractor to ask for any extension of time at that particular time, because of the fact, first, that it was premature, because the contractor would not know until further on in the performance of the contract

(Testimony of DeLancey C. Smith.)

whether or not he could complete the contract within the time called for by the terms of it. Secondly, he said he did not approve the granting of an extension of time to a contractor as a general matter if it could be avoided, because the contractor would perhaps then, if he was given time, dilly-dally and play along with the job and not work as hard as he should. I pointed out to him that I considered it was a rather foolish [1630] presumption, because the contractor must work as hard and fast as possible in order to make any money, the sooner he gets through the more money he makes. The discussion was friendly in tone and that was about all that was said then.

Q. Did you have any other conversation with Mr. Boggs shortly thereafter?

A. Within two or three weeks thereafter, I think the exact date was about the 15th or 16th of April.

Q. Where was that conversation held?

A. It was likewise held at his office.

Q. Who was present?

A. Mr. Boggs and myself.

Q. Will you state what was said?

A. Well, in substance I told him that I had further examined the question of time; we discussed some other matters which are not here involved—and that I felt the contractor should file an application for an extension of time based on what I discovered, and he said that while he thought the contractor was entitled to some time based on the

rainy season, that he would not feel that he should file an application for extension of time at that time. That was the sum and substance of what he said. I told him at any rate, I would have to advise the contractor to do it, as perhaps it might be argued that he was waiving his claim for an extension if he did not.

Q. Did you, on or about November 19, 1935, have a further discussion with Mr. Boggs concerning an extension of time?

A. Well, I had a later conversation before November with him about the same subject, at the meeting of the directors of the District, on June 10, 1935, when I was present, and I wrote an application to the directors for an extension of time, and after the meeting Mr. Boggs told me that the District would deny it, but that the denial would be purely on the ground that it was premature, and that while he felt we were entitled to some extension, he was not [1631] going to pass on the question then.

Q. What was the next conversation you had with Mr. Boggs respecting an extension of time?

A. The next conversation I had with him was in November, at the tunnel office, and there were present Mr. Bechtel, Mr. Hindmarsh, myself and Mr. Boggs, as I have already testified.

Q. What was said at that time?

A. Well, the meeting lasted probably an hour and a half or two hours; I did not do much talking at the meeting. Some other questions were dis-

(Testimony of DeLancey C. Smith.)

cussed that are not involved here, but one of the principal questions that was discussed was the question of an extension of time. Mr. Hindmarsh told Mr. Boggs that the contractor should be given an extension of time by reason of the cave-in of August 28, and the delay that had resulted to the work. Mr. Boggs stated in substance that he agreed with that position, but he did not know how much time he would feel that the contractor was entitled to. Mr. Hindmarsh said he thought probably 90 or more days, perhaps 120 days. Mr. Boggs stated that he did not think that perhaps it was that much, but perhaps 60 days would be about right, but he would have to look into the matter before he would fully agree on it. We then worked out a program with Mr. Hindmarsh, by conversation, which provided that Mr. Hindmarsh would furnish him, Mr. Boggs, with a completely new schedule of work sometime after the first of the coming year, and that that new schedule would give Mr. Hindmarsh's best judgment as to how long it would take to complete the entire job in the contract time. Mr. Hindmarsh and Mr. Boggs agreed by interchange of words that when that construction schedule was submitted that Mr. Hindmarsh would then prepare a letter, filing it, and asking for the necessary time to complete the job, and Mr. Boggs said he would be prepared [1632] and try to agree on that feature.

Q. Is that all you recall of that conversation?

A. No, there was another element in it, and it

(Testimony of DeLancey C. Smith.)

was this: Mr. Boggs said in so many words that any letter which was submitted should be put on non-controversial grounds, that he did not want any issue raised that might cause friction between the Board of Directors and the contractor, and he also said that he felt the contractor might need some time that was not now known about, because there might be heavy spring rains in 1936 that might further delay the work, particularly the outside paving work, and therefore it would be advisable to try and agree on a program early in the coming year.

Q. Is that all you recall of that conversation?

A. That is the sum and substance of it.

Q. Now, Mr. Smith, who was Mr. H. L. Hinman?

A. He is one of the directors of the district.

Q. And also treasurer of the district?

A. Yes. The district has three directors, Mr. Stow, who recently died, Mr. Hinman, and Mr. Caldecott.

Q. Did you ever have any conversation with Mr. Hinman about the matter of extension of time?

A. I had several. I have known Mr. Hinman for a good many years, and he came to my office four or five times in the summer of 1935.

Q. Can you state the date of the first conversation with Mr. Hinman, where it was held, and who was present?

A. I took a memorandum off of my office record

(Testimony of DeLancey C. Smith.)

of calls that gives those dates, if I may be permitted to use it.

Q. Surely.

A. The first time he came to see me was on April 2, 1935.

Q. And just the two of you were present?

A. Yes, in my office.

Q. What was said at that time?

Mr. Wittschen: Objected to as immaterial, and calling for hearsay, [1633] and not binding on the District, being matters beyond the control of a director, to be determined by the engineer and not by the treasurer of the district. The action of the Board could only be the action of the Board as it appeared in the minutes.

Mr. Marrin: There has been an issue raised in this case which is stated very clearly in Mr. Wittschen's opening statement to the effect that plaintiff in this case, by not rescinding when the application of June 10, 1935 was filed, waived the right to rescind on account of the denial of the application for the extension of time. We propose to show by this testimony that Mr. Hinman, the treasurer and director of the district, told Mr. Smith that that denial was simply a formal denial and meant nothing, and that later the district would grant sufficient time to complete the work, and I think that that has a very strong bearing on that issue.

The Court: As a matter of law, how could an

(Testimony of DeLancey C. Smith.)

individual, he being the treasurer and one of the directors, bind the other two directors of the District?

Mr. Marrin: Perhaps he could not legally bind the District acting as an individual, but I think that the statement of the officers of the district which tended to mislead the plaintiff in its decision are entitled to be shown here, particularly where the defendants are taking the position that by not properly rescinding when that application for extension of time was made that the plaintiff lost any rights.

The Court: I will give you a record on it.

Mr. Wittschen: I can give your Honor a case squarely on that point, that an individual treasurer or individual director could not legally bind the district.

The Court: The reason I have indicated that is I want both [1634] sides to have a record. I do not want to mislead either side. I will allow a record on it. Note an exception.

Mr. Wittschen: Note an exception.

A. Very little was said at the very first meeting that I had about the question of time. We had a friendly discussion, I had known him for many years. The discussion was more general than specific about the tunnel project. However, I did mention to him that I would like to talk with him further, and he said that he would be glad to talk with

me, although he was not sure it was a proper thing, and I told him he was a public official, and we had a perfect right to talk to him as a public official, because he was acting in his capacity as such when I was talking to him, and I was not trying to prejudice his actions in any way. I saw him later in June, on the 5th of June, and in July, on the 15th of July, and in August, on the 7th.

Q. Who was present at those conversations?

A. All three conversations that I have just mentioned were held in my office in the Balfour Building in this city. Mr. Hinman came to see me—

Mr. Tinning: What were the dates of those three last conversations?

A. They were June 5, July 15, and August 7.

Mr. Marrin: There were four, April 2, June 5, July 15 and August 7, all in 1935.

A. Yes.

Q. At all of those conversations just you and Mr. Hinman were present?

A. Yes, they were held in my own office and he came into my office alone. As a matter of fact, once or twice he came on a legal matter that I was handling for a group of which he was a member.

Q. Will you state what was said at that conversation?

Mr. Wittschen: The same objection, on all of the grounds stated.

The Court: The same ruling.

Mr. Wittschen: Exception. [1635]

(Testimony of DeLancey C. Smith.)

A. The sum and substance of them—it is difficult for me to recall what was said at any specific conversation in exact words, but the sum and substance of the three conversations was that particularly, the one of July 15, that the communication that the Board of Directors had sent to the contractor denying their application for an extension of time was solely on the ground it was premature and that later in the event Mr. Tinning and Mr. Boggs recommended he would vote to grant us time, as he felt we were entitled to it. That was the sum and substance of it.

Q. That was the substance of the conversation?

A. Yes.

Mr. Marrin: You may cross-examine.

Cross Examination

Mr. Tinning: Q. Mr. Smith, when Mr. Hinman came to your office did you state that you were representing him in connection with a group of other men?

A. I had been doing some work for a committee of which he was a member.

Q. In connection with the reorganization of the Merchants Express Company, of which he had formerly been chief owner?

A. No, at the time I speak of he was no longer connected with that.

Q. But it was in connection with a Merchants Express matter, was it not, that he was seeing you?

(Testimony of DeLancey C. Smith.)

A. No, it was in connection with another matter of which that was a purely collateral matter.

Q. What was the matter?

A. He was a member of the Bondholders' Committee of the United American Utilities, Inc., and I was attorney for the Bondholders' Committee.

Q. The United American Utilities was the company that purchased the Merchants Express?

A. Many years before that.

Q. Mr. Hinman had taken some of the securities to pay for his interest in the Merchants Express?

A. To his sorrow.

Q. And all of the rest of the bondholders?

A. Yes. I was representing [1636] the Bondholders' Committee. I want that to appear in the record. I had nothing to do with the organization of the company or with the taking of these securities by Mr. Hinman.

Q. We will accept the exoneration clause. The point that I have in mind here, now, Mr. Smith, is that Mr. Hinman was not going to your office to discuss the district matters with you, he was going to your office to discuss a business matter in which you represented a committee of which he was a member?

A. No, that is not entirely true. I can clarify your mind on that very quickly. The matter had been cleaned up by the time that 1935 rolled around, except for the possibility that what he had taken

(Testimony of DeLancey C. Smith.)

for the bonds that he had exchanged in the reorganization might be changing status as to value; he wanted to keep posted, and would come in and ask me a question; that would take five minutes.

Q. So that he did not come there to call upon you and discuss district business as the district representative? A. Once he did.

Q. What was the date?

A. I would say that was the next to the last time I have testified to.

Q. By that you refer to July 15, 1935?

A. That is correct, so far as I can remember.

Q. Are you sure of that?

A. I could not be absolutely positive that we did not mention the other business, but he came, and I am positive that he came to me once, because he wanted to talk to me about the problem of the contractor on the Broadway Tunnel.

Q. He knew from sometime in June, at least June 10, 1935, that you were representing the contractor? A. He knew it in April.

Q. He knew it in April? A. Yes.

Q. At the time of your first conversation of April 2? A. That is correct.

Q. I believe you said that the second conversation you had with Mr. [1637] Boggs was about the 16th or 17th of April, in Mr. Boggs' office.

A. My memorandum diary from our office records shows it was on the 16th of April.

(Testimony of DeLancey C. Smith.)

Q. Have you any memorandum of the conversation? A. No.

Q. That is, your office diary has a note that you were at Mr. Boggs' office on April 16, 1935?

A. That is correct.

Q. You are testifying from memory as to what was said? A. That is absolutely correct.

Q. Does your office diary show that on the 10th of April, 1935, you had a conversation with Mr. Boggs and myself, in your office in the Balfour Building, at which time Mr. Marrin was also present?

A. It probably does, but I think that was at Mr. Marrin's office, I think that the meeting was at his office.

Q. Do you remember that we came down to your office, and at that time there were three matters under discussion, one the matter of wage scale, reclassification of labor, reclassification of the wage scale in an attempt to meet the same situation that the Six Companies or some constituent company had experienced on some other job where there had been some confusion, and you desired to have it more specific, what you might call an intermediate scale?

A. That is not an exactly correct statement, but it is approximately correct. The fact is that the definitions in the wage schedule provided by the dis-

(Testimony of DeLancey C. Smith.)

trict were not accurate for the proper compensation of the men in accordance with their duties, and we desired to reclassify them.

Q. In your opinion?

A. Well, we established we were right, because you altered the scale to conform to our request.

Q. Kindly stick to the facts, we did not give you a letter in the form requested. At the same conversation, Mr. Smith, do you remember the matter of extension came up, and Mr. Boggs told you [1638] that the answer was no on engineering and extension?

A. My recollection of the conversation, is fairly clear, and as I recall it one of the subjects was classification of the labor, and the second our point on running lines and grades; I do not recall any discussion of an extension of time at that conversation.

Q. You have no memorandum?

A. I have no memorandum of the conversation. I have a memorandum of the date.

Q. But not of the conversation? A. No.

Q. You stated that the conversation that occurred on the 19th of November, 1935, at the west portal building, was—at which Mr. Hindmarsh, Mr. Price—

A. (Interrupting) I did not say Mr. Price was there.

Q. You are correct, Mr. Hindmarsh and Mr. Bechtel and yourself and Mr. Boggs were present?

A. Yes, that is right.

(Testimony of DeLancey C. Smith.)

Q. That was on the 19th of November?

A. That is correct.

Q. You say you did not say very much? That is correct, too, is it not?

A. Well, I tried not to.

Q. Mr. Smith, is it not a fact that you asked what had happened in regard to the 48-hour wage authorization?

A. I might have. I do not say that I did not.

Q. Isn't it a fact that you received an authorization the next day, the day following?

A. I may have. That is not here involved.

Q. Well, I am going to get the full conversation, Mr. Smith, if I can, to refresh your recollection. Isn't it a fact that Mr. Boggs told you at that time that he had notified Mr. Price by telephone immediately upon receiving the authorization from Mr. C. H. Sweetser, the District Engineer of the Bureau of Roads, and that he would send a copy of the letter of Mr. Sweetser at once directed to the Six Companies?

A. That is very possibly correct, I would not say it is not. [1639]

Q. It is a fact, it is in evidence here as one of the exhibits, a letter that was addressed to Six Companies by Mr. Boggs on the same day, November 19, 1935, that was received on the 20th by Six Companies.

A. I don't know.

Q. You don't remember the record? A. No.

(Testimony of DeLancey C. Smith.)

Q. Do you remember, then, that Mr. Bechtel and Mr. Hindmarsh then discussed the reopening of drift excavation and the question was then discussed as to whether the 43-hour week would apply in driving further in the tunnel?

A. I remember there was a discussion about resumption of operations, both as to the method, manner and time.

Q. And at that time Mr. Boggs stated that he understood the orders from the P.W.A. office authorized the 48-hour week on the recovering of the tunnel, and when that was done and the concreting was done, all other work would have to be done under the 40-hour week?

A. I wouldn't say that last part, but I want to say it was generally understood, and if it was discussed at that meeting it was substantially correct; I have not a clear recollection that it was mentioned at that time.

Q. Then do you remember that Mr. Bechtel said to Mr. Boggs an application for an extension of time would be necessary by the Six Companies and you said that Mr. Boggs said last spring that the application was premature and an extension might be necessary, and asked if Mr. Boggs still held that opinion. Do you remember that?

A. Well, that question includes too much. I remember a portion of it.

Q. What do you remember?

(Testimony of DeLancey C. Smith.)

A. I remember that it was mentioned, by whom I do not recall.

Q. Whether you said it or someone else, that is a correct statement?

A. I do not recall who said it, but the way it came up was substan- [1640] tially this. Mr. Boggs said during the earlier part of the year that we were premature in asking for an extension of time at that time, because we did not know then how long it might take us to complete, and that was the reason why they had turned us down.

Q. And that an extension might not be necessary?

A. And if that were true an extension would not be necessary to enable us to complete within the time fixed, or the extended time which might be granted.

Q. And do you remember whether you or Mr. Bechtel asked Mr. Boggs if the opinion that he at that time had was still held by him?

A. I imagine it might have been said, I would not say it was or was not said. But this conversation lasted quite a long time, from about 10 a. m. to noon, and a lot of talking was done.

Q. Do you recollect that in response to that question Mr. Boggs replied that he still considered that an application at that time would be premature and further, for the information of the contractor, that any application for an extension of time must be approved by the P.W.A.?

(Testimony of DeLancey, C. Smith.)

A. No, I do not recall that being said, and in that connection my recollection of what was said is quite different, because there was a specific understanding reached that Mr. Boggs would cooperate with Mr. Hindmarsh in the filing of an application based on a new construction schedule to be submitted in January, and on an agreed form of letter which they would draw and on which we agreed in connection with the handling of that schedule.

Q. You told us that before. Now, with respect to the particular matter that I have just referred to, do you remember at that time Mr. Boggs stated that he still considered that an application for an extension of time was premature, and that any such application [1641] tion must be approved by the P.W.A.?

A. He might have said that, but in saying it, if he did say it, he also said he would have no difficulty in getting cooperation from the P.W.A. on anything that he put in.

Q. So if he said that, he said something else, too, that I have not asked?

A. He supplemented it with the comment I have just made.

Q. Do you remember that you then asked Mr. Boggs whether his recommendation would probably be followed by the P.W.A.?

A. That is bringing out the point I just mentioned.

Q. Did he say that to you?

(Testimony of DeLancey C. Smith.)

A. It probably was said; it might not have been said in those words; I did not put down in detail what was said by A, B, C or D.

Q. Then did you state to Mr. Boggs that in view of the erroneous geology, unforeseen difficulties in the ground, that the request might easily be granted?

A. Yes, I recall, now that you mention it, that I did state that the fact that we had different ground conditions than were represented alone justified an extension, and Mr. Boggs, in reply to that, suggested that we avoid asking for an extension on that ground, because it would create a dispute between the contractor and the district, probably, and he thought he could get it through without raising that point.

Q. Did you at that time and place, in that conversation, following your statement that Mr. Boggs—do you remember that Mr. Boggs said to you that such matters had already been discussed and acted upon and that his recommendation was still no?

A. He did not say any such thing. He said just the opposite of that. At no time did he say that.

Q. Isn't it then true that you then stated to Mr. Boggs that you realized his technical decision might be no, but that it might [1642] be possible to change that decision?

A. No. Mr. Boggs and Mr. Hindmarsh conducted 99 per cent. of the conversation about extension of

(Testimony of DeLancey C. Smith)

time, and the sum and substance of it was just as I stated it.

Q. Did you send any company memorandum through that you thought the district engineer was weakening at this time?

A. I do not quite understand that question.

Q. Do you remember Mr. Price's memorandum saying he was softening at this time?

A. I do not remember the Price memorandum. If you will show it to me, I will tell you.

The Court: Softening up, was it not?

Mr. Tinning: Yes.

The Court: I thought I remembered something to that effect.

Mr. Tinning: I think it is the memorandum of December 26th.

Q. Did you write a memorandum to the company on this conversation?

A. I don't recall whether I did or not. It was discussed fully orally. Mr. Bechtel and I left the conference and came to San Francisco and Mr. Bechtel showed me the letter that he wrote Mr. Hindmarsh the following day.

Q. Was there anything in the letter about the District Engineer softening or weakening?

A. No. I think that letter was offered here in evidence.

Q. That is the one that is in here.

Mr. Marrin: The letter, I think, is not an ex-

(Testimony of DeLancey C. Smith.)

hibit. I think it was read into the record. That is my recollection.

Mr. Tinning: It is in evidence at any rate.

Mr. Marrin: It had to do with lines and grades.

Mr. Tinning: It had nothing to do with the extension.

Mr. Marrin: That is right.

A. Well, the colloquy between counsel is not concerning the matter that Mr. Tinning asked me about. I have referred to a letter written [1643] ten by Mr. Bechtel to Mr. Hindmarsh after this particular conversation.

The Court: The following day?

A. Yes, the following day.

Mr. Tinning: That is in evidence, and it has been testified that Mr. Hindmarsh was instructed to prepare a schedule of proposed work.

A. But it says nothing about lines and grades which was just discussed between counsel.

Q. It says nothing about time, either?

A. I think it does, read in the light of what had been said the day before between the parties involved, it certainly refers directly to the time.

Q. Did you state to Mr. Boggs at the time that you realized that his decision, his technical decision, might be no, but it might be possible to change his decision?

A. I never said any such thing. He did say he was in accord with the right of the contractor for an extension at that time, but said he could not

(Testimony of DeLancey C. Smith.)

agree on the exact time. That was the only limitation he placed on his answer.

Q. Didn't he state to you at that time and place from all possible viewpoints his answer was still no for any reason that had been suggested?

A. He did not say any such thing; he said exactly contrary thereto.

Q. Isn't it true that Mr. Bechtel said to Mr. Boggs he thought Mr. Boggs ought to be able to cooperate with them in fixing up some good reason for an extension?

A. We'l, Mr. Bechtel and Mr. Boggs both discussed that any application for an extension which might be filed after January 1st, as was discussed earlier, should be upon grounds which they would have to figure out were proper, which avoided the issue which he, Mr. Boggs, felt was to be controversial, namely, the deviation of the ground condition from that represented, and it was along that line that that subject was mentioned.

Q. Do you remember that after the commencing of the discussion of [1644] this proposed letter requesting an extension Mr. Boggs stated to you that there were enough representatives in the Six Companies organization to prepare their own letter?

A. No, Mr. Boggs was not taking a supercilious or saucy attitude; he was very much of a gentleman. I think that would have been an offensive remark.

Q. You would think that suggestion was saucy?

A. If he said that it would have been, but he

(Testimony of DeLancey C. Smith.)

did not say it; he said it in a joking way, it was perfectly harmonious.

Q. Didn't Mr. Boggs then state that he thought that a new schedule of operation should be prepared by the contractor, and that he would probably write a request for one?

A. Does your question bear the implication that that exact language was used?

Q. I am asking in substance and effect.

A. Well, in substance and effect it was agreed that a new construction schedule would be submitted. I do not recall any mention that he would write and ask for it, but it was agreed that it would be submitted.

Q. Mr. Smith, I asked you if Mr. Boggs did not suggest that a new construction schedule be submitted?

A. I would not want to say who was the author of the suggestion; it might have been Mr. Boggs and it might have been Mr. Hindmarsh, or it might have been Mr. Bechtel.

Q. Then didn't Mr. Bechtel state the Six Companies would file one about January 1, after they had resumed driving, and knew about what rate of progress they could make?

A. I think in substance that was said, but it was said by Mr. Hindmarsh, as I remember.

Q. Isn't it true that Mr. Bechtel then told Mr. Boggs that Six Companies would start in driving drifts ahead in the tunnel in the next few days?

(Testimony of DeLancey C. Smith.)

A. I do not think it was said by Mr. Bechtel; if it was said I think it was said by Mr. Hindmarsh.

Q. And as soon as the debris was cleared out the down-grade tunnel [1645] they would start in ringing out in the other tunnel?

A. I don't remember the exact detail of what was said as to the next move in construction.

Q. Isn't it true at that time Mr. Bechtel advised Mr. Boggs that Mr. Hindmarsh was in charge of the tunnel work, and requested Mr. Boggs to address all of the letters with respect to tunnel work to Mr. Hindmarsh?

A. Well, I knew that was a fact. I don't know whether it was said or not, it might have been said.

Q. That Mr. Price was still project manager, but would be absent from the work from time to time?

A. That might have been said. I do not say it was not.

Q. And then that Mr. Boggs requested a letter from Six Companies authorizing the District to address communications to Mr. Hindmarsh, in view of the previous letter as to who was in charge of the work that had been sent to him by Six Companies?

A. That might have been said. I do not say it was not. [1646]

Mr. Tinning: Q. Isn't it true that Mr. Bechtel stated that he thought Mr. Boggs should write di-

(Testimony of DeLancey C. Smith.)

rectly to Six Companies, Incorporated, and let them route their mail as they saw fit?

A. I did not hear your question.

(Pending question read by the reporter.)

The Witness: A. No; Mr. Boggs never said any such thing.

Mr. Tinning: Q. Then, is it true Mr. Hindmarsh discussed some of the details of construction with Mr. Boggs, and Mr. Boggs asked him to take them up with the resident engineer,—Mr. Gelston?

A. There was some discussion of the construction details; but I did not pay a great deal of attention to that, because they were talking about something I did not know much about.

Q. Then, isn't it true Mr. Boggs drove you and Mr. Bechtel to the Key Route train at 40th and Broadway? A. Well, I think he did.

Q. During the drive down with him, Mr. S. D. Bechtel stated to Mr. Boggs that they hoped,—Six Companies hoped he would discuss freely with them any problems which might arise? Do you remember that part of the conversation?

A. He may have said that; but I don't think—

Q. During that—

A. (Continuing) —it wouldn't be noteworthy, and I wouldn't have made much note of what we were talking about in the automobile.

Q. By "making note," you mean in your head, in your memory?

(Testimony of DeLancey C. Smith.)

A. Well, I have a clear recollection of what occurred. We were talking about the big football game on the following Saturday, going down in the car.

Q. By "making note," you mean things that you have kept and paid attention to, and remembered; or did you keep written notes?

The Court: Mental notes.

The Witness: A. Mental notes I am talking about.

Mr. Tinning: Q. Do you recollect that, as the conversation [1647] closed and you were leaving the car, Mr. Boggs asked Mr. Bechtel as to what status Mr. O. W. Peterson would have on the job, in view of Mr. Hindmarsh having charge of the tunnel?

A. I don't recall Mr. Peterson's name was mentioned in any of the conversation, except at the tunnel office; it came up in connection with some of the suggestions he had made as to construction methods.

Q. Mr. Smith, how long have you been Mr. Bechtel's attorney?

A. How long have I been Mr. Bechtel's attorney?

Q. Yes.

A. I have never had that distinction.

Q. Have you ever represented the W. A. Bechtel Company?

A. I represented them once, about ten years ago,

(Testimony of DeLancey C. Smith.)

in the absence of Mr. Thelen and Mr. Marrin—a small matter.

Q. How long have you represented, prior to the 3rd of April or the 2nd of April, 1935, any one of the constituent companies or individuals who form the constituent companies of the plaintiff in this action,—Six Companies of California?

A. I represented Mr. Charles A. Shea, who was an individual at the time I represented him—or, rather, a member of a partnership, which later became a corporation; and I first began to represent him in the summer of 1925, in connection with the construction of the East Bay Municipal Utility District, for which he and another concern got a contract as to a large portion of the work.

Q. The evidence here shows, Mr. Smith—I will try to shorten this—that, when the conversation that you say occurred on August 7, 1935, between yourself and Mr. Hinman, Six Companies had already written its letter to the District dated July 26, 1935, in which it made various claims with respect to the work and extension of time.

A. Yes. I don't think there is any question about that.

Q. You knew about that?

A. I think I wrote the letter.

Q. Yes. I thought so. So, when you say Mr. Hinman had been in [1648] your office on the 7th of August, 1935, it was at a time when the District had already received your letters which stated that

(Testimony of DeLancey C. Smith.)

if they did not receive a reply—the Contractor did not receive a reply by the 7th of August, that you were going to take legal action against the District?

A. That was only on the question of lines and grades; and that legal action would possibly have been declaratory relief, which we were considering filing at that time.

Q. It was not so mentioned in the letter?

A. Well, certainly legal action includes declaratory relief.

Q. Yes, I will agree with you on that. But the words “declaratory relief” were not mentioned in the letter? You had no reply from the District on August 7, 1935?

A. The letter was signed by the Company. Whether the Company got a reply, I don't know.

Q. Well, you have been here for some time; you have not seen any reply to that letter, have you?

A. My recollection of the record is that no reply has been made and the testimony so shows.

Q. And there was no action?

A. No action; no.

Mr. Tinning: That is all.

The Court: We will take a recess.

(Recess)

Mr. Smith: Your Honor, I am sorry I did not get a chance, before the recess, to state to the Court that the plaintiff in this case comes to a logical

(Testimony of DeLancey C. Smith.)

pause in the nature and character of its testimony to be hereafter produced, which-I was expecting to put in through my questioning. The remainder of our witnesses are semi-expert in character; they are experts, but they are also on facts; and we did not anticipate they would be reached this week, and they are not available; and, if it is agreeable to your Honor, we would appreciate an adjournment, so long as you are going to [1648] adjourn, anyway, for a couple of weeks until you return from your proposed Sacramento trip. I understand the defendant has no objection.

The Court: How many witnesses have you?

Mr. Smith: We have probably four more, your Honor; and we will gain time by this adjournment, because their testimony will be shortened by the fact that we will have time to consult with them before they testify; and we would like, therefore, to suggest an adjournment at this time until after your return from Sacramento.

The Court: Well, then, the case will go over until the 24th.

Mr. Smith: The 24th of May at ten o'clock a. m.

The Court: Yes.

(Thereupon, an adjournment was taken until Tuesday, May 24, 1938, 10 o'clock a. m.) [1649]

(Testimony of DeLancey C. Smith.)

Tuesday, May 24, 1938;

10 o'clock a. m.

The Court: You may proceed, gentlemen.

Mr. Wittschen: In this matter, if the Court please, a few days ago we were served with a printed copy of a memorandum of points and authorities by the plaintiff entitled "First Supplemental Brief." For the convenience of the Court, we have made a reply thereto, but having made our authorities in looseleaf form we felt it would be more convenient if we merely added some supplemental pages to that so your Honor's secretary could insert them in the proper place, and we have also redrafted the last page of the index because of that change in the brief.

J. PAUL ST. SURE,

called by the plaintiff; sworn.

Direct Examination

Mr. Marrin: Q. What is your occupation, Mr. St. Sure? A. Lawyer.

Q. Were you employed in that capacity by the plaintiff in this case,—Six Companies of California? A. I was.

Q. About when were you employed?

A. Beginning in February of 1936.

Q. Have you been continuously in the employ of the Company since that time? A. I have.

(Testimony of J. Paul St. Sure.)

Q. Did you ever discuss with Mr. A. B. Tinning, one of the attorneys for Joint Highway District No. 13, the defendant here, the subject of the District granting to plaintiff an extension of time within which to complete the performance of the work under the contract between plaintiff and defendant for the construction of the Broadway Low Level Tunnel? A. I did. [1650]

Q. When did you discuss this matter with Mr. Tinning?

A. My recollection is it was either the 5th or 6th of May, 1936.

Q. Where was the discussion held?

A. At Washington, D. C.

Q. Who was present?

A. I believe, just Mr. Tinning and myself.

Q. Will you state what was said by you and by Mr. Tinning at that time?

Mr. Wittschen: Objected to as immaterial and calling for a conversation which does not bind the District, or at least does not tend to disclose any arbitrary acts of the Engineer. It is specifically provided in the contract that extensions of time may be granted by the Board of Directors and that they shall be granted for certain reasons which are set out, or any other acts or circumstances which, in the judgment of the Engineer, would delay unnecessarily the work. A conversation between two attorneys representing the parties would be immaterial.

(Testimony of J. Paul St. Sure.)

Mr. Marrin: We offer this to prove, by the witness, that prior to the filing of the last application for extension of time Mr. St. Sure discussed the matter with Mr. Tinning, and Mr. Tinning told Mr. St. Sure in advance that the application would be denied; and we offer it for the purpose of proving that the Engineer in this case never exercised any judgment or discretion at all with respect to this application, but that the defendant's attorney had stated, in advance of making the application, that it would be denied.

Mr. Wittschen: What the defendant's attorney stated if the Engineer were not present would not bind the Engineer. If he had a conversation with the Engineer, I would not object to it.

Mr. Marrin: It would be binding on the District.

Mr. Wittschen: Not necessarily.

The Court: It may go to the representative's state of mind [1651] and subject to correction that it could not legally bind the Engineer; there may be some question as to the judgment of the representative of the District. I will allow it subject to a motion to strike out and over the objection of counsel.

Mr. Wittschen: Note an exception.

The Witness: May I have the question read?

(Pending question read.)

The Witness: A. Well, I stated to Mr. Tinning that we had received a communication from California, calling to our attention the fact that it might

(Testimony of J. Paul St. Sure.)

be necessary to apply for an extension of time before the 24th of May, 1936; that I felt we should make such application for extension; that I should advise him of it since he was on the ground in Washington. My recollection is he stated to me we could make such application or do whatever thing we felt would necessarily amply protect our rights, but the application would be denied. He stated that he felt the Six Companies were entitled to an extension of time, but just what that extension would be he did not know; he felt it best, from the District's point of view and his point of view, to deny the application in its entirety, that we should not be concerned with the fact of denial, because there would not be deductions made for extensions beyond the time but that the matter could be adjusted at the conclusion of the work, or the conclusion of the relationship, and he felt the District was amply protected by the withheld percentages without the necessity of any determination being made immediately, or determining at that time the question of how much of an extension should be granted. That, as I recall it, was the conversation, or the substance of it.

Q. I show you, Mr. St. Sure, a copy of Exhibit "SSS," which has been introduced in evidence in this case, and which is the application for an extension of time dated May 8, 1936. Did you prepare [1652] that application? A. I did.

Q. Following your conversation with Mr. Tinning? A. Yes.

(Testimony of J. Paul St. Sure.)

Q. The application is for an extension of 600 days. Will you state, according to your best recollection, how that amount was arrived at?

Mr. Wittschen: Objected to as incompetent and immaterial and in no way binding on the District and as self-serving. The exhibit speaks for itself. They asked for 600 days.

The Court: The ultimate fact is they asked for 600 days.

Mr. Marrin: Is the objection sustained?

The Court: The objection will be sustained at this time.

Mr. Marrin: Note an exception. You may cross-examine.

Cross Examination

Mr. Tinning: Q. Mr. St. Sure, where did this conversation that you referred to occur?

A. My recollection is that it was at the Shoreham Hotel.

Q. In Washington, D. C.? A. Yes, sir.

Q. As a matter of fact, it was on the last day that I was in Washington, was it not?

A. I think that is true, yes.

Q. That was the 8th of May, 1936?

A. I would not be sure of the date. It was just before you left, as I recall it.

Q. At that time, who was present at the conversation?

A. My recollection is that you and I were together; nobody else was there.

(Testimony of J. Paul St. Sure.)

Q. Mr. Boggs, the District Engineer, was not present? A. He was not.

Q. Was any other representative or employee of the District, or any officer of the District present? A. No, sir.

Q. They were all in Oakland; I was the only one in Washington?

A. I assume they were in Oakland. You were the only one there [1653] that I remember.

Q. I was the only representative of the District in Washington at that time?

A. So far as I know.

Mr. Wittschen. We, at this time, make a motion to strike out the conversation as related by Mr. St. Sure with Mr. Tinning in Washington, D. C., on the ground it is not binding on the Engineer, who was not present, and it was not binding on the Board of Directors of the District, who were not present and who were at home. Assuming the conversation took place, Mr. Tinning was not authorized to make any such statements on behalf of the Board of Directors or the Engineer.

The Court: I will allow the record to stand at this time. You may renew your motion if it becomes necessary.

Mr. Wittschen: Exception.

Mr. Tinning: Q. Mr. St. Sure, isn't it a fact that we were in Washington at that time on the basis of an effort made by yourself,—representing Six Companies of California, and Mr. Kaiser, who was president of the Company at that time, at the time in question,—and the District, to work out some

(Testimony of J. Paul St. Sure.)

method that would be mutually agreeable and also that could be worked out for the settlement of the claims of the Contractor which had been made in July and August, 1935, wherein they claimed additional compensation for what they claimed to be extra work? A. Yes.

Q. There were numerous conferences after you became the attorney for Six Companies in February, 1936, between yourself and myself and representatives of the District and Mr. Kaiser and other representatives of Six Companies?

A. That is correct.

Q. And that, at the time that you have referred to, Six Companies had stated that they had a claim in excess of a million and a half dollars against the District for extra work?

A. I wouldn't [1654] recall the figure, but I recall there was a claim.

Q. Do you recall a document that was printed, with photographs and a suede cover and a dramatic story of the difficulties of the Contractors, and that was delivered to Mr. Thomas MacDonald, Chief of the Bureau of Public Roads, after we arrived in Washington? A. Yes, sir, very well.

Q. Also to Colonel Westbrook of the WPA?

A. Yes.

Q. Also to Mr. Berlew, the Assistant Secretary of the Interior under Mr. Ickes, who was Administrator of the PWA? A. Yes.

(Testimony of J. Paul St. Sure.)

Q. That book embodied a statement in which there is a claim up to that time——

A. Yes; right.

Q. One million, seven hundred seven thousand odd dollars?

A. If it was stated, I assume it is. I don't recall it exactly. In the appendix, the statement appears that the original estimated cost was \$4,195,000, and the probable cost was \$6,630,100. I assume that is what you refer to.

Q. Yes.

A. That statement appears in the booklet.

Q. Yes.

Mr. Tinning: Mr. Marrin, may I ask you this question—maybe my understanding was not accurate: There were actually two parts to this document. I do not care to put it in evidence, or offer it, gentlemen, as I think it will simply clutter the record, but if you wish——

Mr. Marrin: No; I don't think it is necessary.

Mr. Tinning: Q. You wrote a part of this, did you not, Mr. St. Sure?

A. Yes; I assisted in the preparation of it, Mr. Tinning.

Q. This conversation that was had with respect to the extension of time occurred after the statements of Mr. Kaiser to Mr. MacDonald in connection with this claim made to Mr. MacDonald at the time that [1655] Mr. Kaiser was seeking to see if there would be additional Government funds to take care

(Testimony of J. Paul St. Sure.)

of the claim of the Six Companies, that the claim of Six Companies was somewhere in excess of one million seven hundred thousand dollars?

A. You say my conversation with you was after the statements that Mr. Kaiser made to the Government?

Q. Yes.

A. I do not recall the statement you refer to. I do recall that the statement was made to Mr. MacDonald and others that there was a claim which was in the neighborhood of two million dollars or thereabouts. The conversation I had with you was probably after those statements were made, yes, because you have recalled to me it was the last day you were in Washington that I talked with you about the extension of time.

Q. And it was at the time that we had our conversation,—about the time we had our conversation; there were no further meetings or conversations between yourself and myself after this instance that you have referred to?

A. Only one telephone conversation that I recall while I was still in Washington and after you had returned.

Q. So, there were no further conferences at which I was present when Mr. Kaiser made any statements to any Government officers or bureaus represented by any Government officers in which he sought to get more money for the claim of Six Companies from some Government body?

(Testimony of J. Paul St. Sure.)

A. After you left Washington, you were not present at any further conversations in Washington.

Q. The object of Mr. Kaiser going to Washington and you going to Washington was an effort to get additional money from the United States to pay the claim of the Contractor if that could be worked out?

The Witness: Would you repeat the question?

(Pending question read by the reporter.) [1656]

The Witness: A. That was a portion of the reasons for going, yes.

Mr. Tinning: Q. Isn't it a fact, during the conversation you have referred to, that you stated to me that someone in California had sent on word at that time the contract time for completion would expire shortly and they were suggesting an extension of time be requested?

A. I believe it was suggested, yes.

Q. And I told you at that time I could see no reason one way why you should prepare any extension of time if your claims were justified, and if they were not, you would be taken care of anyway?

A. My recollection is, Mr. Tinning, that the statement was made that undoubtedly we were entitled to some extension of time.

Q. Well, of course, there is a sharp conflict of memory on that.

A. I assume there is. You asked me to restate my conversation with you?

(Testimony of J. Paul St. Sure.)

Q. No; I have not asked you to restate it. I am cross-examining you, Mr. St. Sure.

A. Pardon me.

Q. Isn't it true, at that time, that I stated to you that I thought the District Engineer would not recommend an extension of time; that undoubtedly it would be denied?

A. I don't recall the District Engineer being mentioned. My recollection is you stated the application would be denied.

Q. Do I understand your testimony to be that I told you that you were entitled,—Six Companies was entitled to the extension of time?

A. My recollection is you stated undoubtedly we were entitled to a portion of the time. Just what that portion would be, you did not know.

Q. In connection with what was that statement made?

A. Well, in connection with the statement I had made to you that we were applying [1657] again for an extension of time, to protect our rights.

Q. While I was representing the District and Six Companies was then attempting to secure two million dollars or approximately that amount from the United States to pay its losses based on a claim the District had misled the Contractor and that the geological report specifically constituted constructive fraud and, at the same time we were taking that position, I told you that you were entitled to an extension of time?

(Testimony of J. Paul St. Sure.)

A. I don't know about all the arguments as to all these things being made at that time; I am giving you my best recollection of the conversation as I remember it.

Q. Mr. St. Sure, you will remember that, after the slide and cave-in that occurred on the 22nd of February, 1936, you came into the case as an attorney for Six Companies? A. Right.

Q. You knew, at that time following your employment, there had been claims made over a period of six or seven months before the date of your employment; you knew that, too? A. Yes.

Q. And you knew that those claims were based upon the alleged constructive fraud of the District in the preparation of its plans and specifications and its geological report?

A. I knew about claims for those amounts.

Q. Well, we had discussed it, had we not?

A. Yes, I think we had.

Q. So, you knew, from some of the conversations that you had prior to the trip to Washington, it had been stated that Six Companies had a claim which they were attempting to satisfy and which was denied en toto by the District; that was all clearly understood before we went to Washington?

A. Yes.

Q. And still, after we got to Washington, you state, now, that I told you that you were entitled to an extension of time? A. Yes.

Mr. Tinning: That is all. [1658]

(Testimony of J. Paul St. Sure.)

Redirect Examination

Mr. Marrin: Q. Mr. St. Sure, this claim that the Six Companies had at the time you were employed and which was advanced in Washington was not for extra work, was it?

A. No; it was not. That is, it was for the delays and the result of the ground conditions and various changes and other matters which were all included within the total claim.

Q. Now, the Six Companies was not attempting to get the money directly from the Federal Government at that time, was it?

A. They were trying to find a means, by Government grant or otherwise, to provide further funds to meet the claim. Six Companies, as a contractor, could not make application for those funds, so we found.

Q. Who would have to make the application?

A. The District.

Q. And the District declined to do so?

A. Yes.

Recross Examination

Mr. Tinning: Q. You were in Washington in August, 1936, were you not? A. Yes.

Q. Again, in connection with the same matter?

A. Yes.

Q. At that time, there was no representative; when you arrived in Washington, there was no representative of the District there; and Mr. Wittschen, who was employed in this matter by the District as associate counsel in connection with this claim, was

(Testimony of J. Paul St. Sure.)

in Boston at the meeting of the American Bar Association, was he not? A. I believe so.

Q. And Mr. Wittschen came down; you wired Mr. Wittschen, didn't you, that you were there?

A. Yes.

Q. At that time, isn't it true that Mr. Wittschen stated that the only basis upon which the District would consider making any application to any Government body was that Six Companies would put a [1659] dismissal of this action in escrow to be delivered if the application was granted, or denied?

A. I recall that suggestion being made, or those conditions being made; but just when and where. I do not remember,—whether it was made in Washington or before or after.

Q. Wasn't it made both in Oakland and in Washington, Mr. St. Sure?

A. It may have been.

Q. You have no specific recollection as to the time; but you know that that condition was imposed as a basis for the District going in and as any consideration for any effort to secure the additional funds?

A. I recall Mr. Wittschen stated that that was his plan and any arrangement that might be made would have to be on that basis, and he would so recommend.

Q. And he was representing the District in Washington while the negotiations were going on?

A. I understood that.

Q. Do I understand, from your reply to Mr. Marrin, that you said that it was not a fact that Six

(Testimony of J. Paul St. Sure.)

Companies claim which was being advanced in May of 1936 was not based upon the fact that you had been misled?

A. I do not recall giving any reply or any question being asked of me.

Mr. Marrin: The question was directed simply to this: that it was not simply a claim for extra work as extra work is ordinarily meant; the claim was based on other conditions.

Mr. Tinning: Well, extra conditions due to doing more than you expected to do, and your original idea of it, whether it be extra timbers, extra excavations, extra concrete,—all of those things were added to your claim.

Mr. Marrin: But I did not want the implication left that it was due to something the District had ordered us to do which was outside the contract.

[1660]

Mr. Tinning: Mr. Marrin, I understand the basis of the claim against the District has always been that there was a vast additional amount of work that was actually performed in excess of that which was contemplated by the Contractor when he undertook this contract, and, roughly, that that vast extra amount of work was extra excavations, extra timbering and extra concrete.

Mr. Marrin: That is true; and, also, of course, that the conditions under which the work as described in the contract was done were very much more difficult.

(Testimony of J. Paul St. Sure.)

Mr. Tinning: Q. You so understood Mr. Marrin's question, Mr. St. Sure?

A. Well, frankly, I had in mind the more technical distinction or definition of extra work as distinguished from additional work. We made that distinct in our thinking. I had in mind, when he asked the question, that he referred to extra work as such.

Q. You understood, by his question, that it meant additional work in addition to that contemplated by the contractor when he undertook the contract?

A. I would ask you to go back to the question and answer. Now that I have listened to your argument—

Q. Well, Mr. St. Sure, I think we are probably quibbling over something; we both probably mean the same thing. You thought extra work meant something that was ordered by the District as an extra under the contract, and you explained you meant additional work, that is, work in addition to that contemplated by the contract?

A. I meant the claim of Six Companies was based, as I understood it at that time, upon this additional work which they were required to do,—additional construction, additional equipment, additional man hours and additional work necessary by the ground conditions which had not been disclosed, and all the other matters which [1661] were asserted.

Mr. Tinning: No further questions.

Mr. Marrin: No further questions.

(Witness excused) [1662]

VICTOR G. HINDMARSH,

Recalled for Plaintiff.

Mr. Marrin: Q. You testified, Mr. Hindmarsh, on your direct examination at page 1096 of the transcript, in answer to the question "Q. What was the condition of the timbering as you observed it?"—the answer as it appears in the transcript is "The timber was in bad condition." That should be "The timber was not in bad condition," should it not?

A. That is right.

Q. Further on, on the same page, appears the statement, "Some of it showed weight from crushing in of the adit rather than anything else." That should be "crushing in at the adit"?

A. At the adit.

Q. The adit never crushed in? A. No.

Q. On page 1101 I asked a question with respect to an exhibit and the transcript now reads in this manner: "Whereas it shows on page 17, with reference to the cross in the square outside the word 'tape'"—the word "outside" should be "opposite"?

A. Yes.

Q. On page 1106, in the question appearing about two-thirds of the way down, it now reads: "Take here between 170+55 and 122+05, there is a date 10/1 to 10/7, 1935." The station should be 117 instead of 170, should it not?

A. Yes.

Mr. Wittschen: I think we could sit down and agree on such things, we have already had that understanding.

(Testimony of Victor G. Hindmarsh.)

Mr. Marrin: Very well, I will not correct any more of these minor matters.

Mr. Wittschen: I think we will save time by agreeing on the record.

Mr. Marrin: Q. Mr. Hindmarsh, there is one matter, however, which I would like to have you testify to. At page 1201 of the transcript appear the following questions and answers: [1663]

"Mr. Marrin: Even if 240 pounds of powder was used in the shot a short time before this cave-in would you consider that was heavy shooting?

A. No, I would not. It depends, of course, on the size of the shot, how much ground you are moving.

"The Court: And the material?

A. And the material. As a rule, this ground only took about three-quarters of a pound of powder—as the record shows, about three-quarters of a pound per yard, which is a very light shooting in any tunnel that has to be shot at all."

To what part of the tunnel shooting were you referring when you said that the average amount was three-quarters of a pound?

A. We were talking about the bench at that time; that is what I had in mind.

Q. By "the bench" you mean the core?

A. Yes.

(Testimony of Victor G. Hindmarsh.)

Q. Your statement of three-quarters of a pound was not intended to apply to the average amount of powder used in blasting the entire tunnel?

A. No; the drifts and rings took a little more powder than the bench did, always do.

Q. Could you state what was the average amount of powder used generally in the entire tunnel?

A. As I remember it, it was one and a quarter pounds to the neat yard.

Q. About one and a quarter pounds?

A. About a pound and a quarter.

Q. You previously testified as to a conversation that you had with Mr. Boggs on January 22, 1936, concerning the question of extension of time, at which time you presented to him a construction schedule and form of letter. Did you thereafter at any time discuss with Mr. Boggs the subject of extension of time of doing the work?

A. No, I did not.

Q. I show you Defendant's Exhibit SSS, which is the application for [1664] an extension of time dated May 8, 1936. Did Mr. Boggs ever discuss that application with you?

A. No, he did not.

Q. Did he ever request you to furnish him data in support of it?

A. No.

Q. Now, Mr. Hindmarsh, you testified that you set the timbers a minimum distance of 3 inches outside of the area in which the concrete lining was to be placed. Where you set the timbers three inches outside of that area in which the concrete was to

(Testimony of Victor G. Hindmarsh.)

be placed and contemplated leaving the timbers in, how far was it necessary to excavate the ground beyond the concrete line in order to so set the timbers? A. Approximately 21 inches.

Q. Will you explain what that 21 inches consists of?

A. There is three inches for clearance on the inside of the timbers, they are 12-inch timbers, three inches of lagging and then practically 3 inches for working space in order to put your lagging in, making a total of 21 inches.

Q. How much reinforcing steel, as specified in the original plans, was to be placed in the Type A section?

A. As I remember, it was one curtain, with 24-inch centers.

Q. During the time you were in charge of the work did the District order this amount increased in any part of the tunnel?

A. Yes, it did considerably.

Q. In about what proportion to the amount of work constructed under your supervision?

A. I would say at least 50 per cent.

Q. How was the increase made?

A. It was made both by less spacing on the inner curtain and also putting in a second curtain, two curtains instead of one.

Q. Would you describe what you mean by a curtain of steel?

(Testimony of Victor G. Hindmarsh.)

A. Well, the plans called for one row of steel in 24 inches over the arch and then the second curtain would be another row over the top [1665] of that one, probably 18 inches apart.

Q. Did this increase in the amount of steel in anyway cause additional difficulties?

A. It always does; it takes twice as much time to put the steel in as originally planned, and it increases your difficulty in putting in your concrete, you have got to work in between two layers of steel instead of on top of one. The biggest delay is in the transportation; one of the biggest troubles you have is in congestion of transportation, especially where you are excavating and lining the tunnel with concrete at the same time; any additional tonnage that it is necessary to take into the tunnel slows up the whole operation.

Mr. Marrin: No further questions.

Cross Examination

Mr. Tinning: Q. Mr. Hindmarsh, you, of course, are familiar with the provisions of the specifications that accompanied the contract with respect to concrete lining? A. Yes, I am.

Q. Do you remember this provision of the specifications, Section 32, about half way down in paragraph 6 in Concrete Lining, on page 61:

“Reinforcing steel, as shown on the plans, is the minimum requirement and the District Engineer shall have the right and authority to

(Testimony of Victor G. Hindmarsh.)

increase the amount of reinforcing steel in accordance with his judgment as to necessity; the contractor shall furnish and place such additional reinforcing steel at no additional cost to the District, other than the price per pound bid for reinforcing steel in place. Reinforcing steel shall conform in all respects to requirements contained in Section 14, Reinforcing Steel, of these specifications."

A. Yes.

Q. In my preceding question Mr. Wittschen calls my attention to the fact that I misstated the paragraph to Mr. Hindmarsh, it is in paragraph 7, and it appears on page 61 as part of Section 32 [1666] of the Specifications. Now, it is true, is it not, that as this steel that you have referred to was ordered and that additional amount of steel was placed, the amount of steel that was placed was paid for by the District in accordance with the price fixed by the contract?

A. That is right.

Q. So that while you had, as you say, transportation and placing difficulties, it was part of the job that the Six Companies undertook, was it not?

A. Yes, it was part of the job, of course, but the tonnage ran over a great amount, which would slow up operations more than anything else.

Q. That is true, but you were being paid for the cost of placing that steel under a price that was bid by Six Companies as a part of its contract?

(Testimony of Victor G. Hindmarsh.)

A. We were paid the unit price, yes.

Q. That was the price that was bid, was it not?

A. Yes.

Q. You never objected to putting in the steel, did you? A. Not that I recollect.

Q. Isn't it a fact, Mr. Hindmarsh, that this provision was put into the specifications for the purpose of giving some flexibility to the placing of the structures?

Mr. Marrin: I object to that question on the ground it is argumentative and improper cross-examination. This witness cannot testify as to the purpose in putting it in.

Mr. Tinning: He is a tunnel expert.

The Court: If he knows he may answer.

A. I do not know what they had in mind; I presume that is what they had in mind so that it could be flexible.

Mr. Tinning: Q. You were not ordered to put this steel in in all places in the tunnel that you constructed, were you?

A. No, I testified about 50 per cent.

Q. Where the District Engineer, in his opinion, and judgment, thought that additional steel was necessary he ordered you to put it in? [1667]

A. That is correct, yes.

Q. And you did it? A. Yes.

Q. And you never protested?

A. Not that I remember.

Q. Did you have a sub-contractor on the steel?

(Testimony of Victor G. Hindmarsh.)

A. Yes, that steel was sub-contracted, but we had to pay the sub-contractor more money.

Mr. Tinning: We ask that that go out.

The Court: It may go out.

Mr. Tinning: Q. The sub-contractor on the steel did not delay the work of the tunnel, did he?

A. Yes, a certain amount; whenever he had more steel to put in it was bound to delay.

Q. Did he fail to supply the steel when you ordered it?

A. No, it was not a question of the supply of steel, it was putting it in.

Q. It was work that was required in putting in the steel? A. Yes.

Mr. Tinning: No further questions.

Redirect Examination

Mr. Marrin: Q. Did the District pay for all of the steel that was placed?

A. No, I do not believe it did.

Mr. Tinning: Q. Did you ever protest that you were not paid for any steel that you put in?

A. No, I did not protest; I don't know whether the company did, or not.

Mr. Tinning: Mr. Marrin, I am somewhat surprised at some of the questions this morning because of matters that occurred in September, 1935. I assume what you are referring to now is the fact that in recovering the break-in, the cave-in which occurred on August 28, 1935, that the Six Com-

(Testimony of Victor G. Hindmarsh.)

panies agreed to do certain work without charge. Is that what you refer to?

Mr. Marrin: No, the District refused to pay for the lapped steel, and they did state, you put the steel in in the south tunnel opposite the cave-in, that you refused to pay for. I simply [1668] asked that question in answer to the question you asked, if they paid for all of the steel. As a matter of fact they did not.

Mr. Tinning: Q. Did you ever present any bill to the District for steel which was not paid?

A. I don't know as we presented any bill at all.

Q. Did you make any protest in writing to the District? A. No, I did not.

Q. Did the Six Companies at any time protest any estimate that was prepared by the District Engineer upon which progress payments were made in this case? A. Not that I know of.

Q. Counsel referred to tie rails and splices—

Mr. Marrin: No, that was lapped steel.

Mr. Tinning: Q. Are you familiar with the provisions of Section 14 of the specifications, Mr. Hindmarsh, appearing in paragraph 8, on page 22 of the specifications,

“only reinforcing steel in place and covered with final concrete will be paid for, and the poundage will be calculated for straight line lengths, no splices included, except where splices are specifically detailed or called for on the plans”?

(Testimony of Victor G. Hindmarsh.)

A. Yes, I remember that.

Q. That is the way you obtained your pay for the steel that you put in?

A. Yes. The only steel that I know of that was not actually paid for was that space in the cave-in.

Mr. Tinning: That is all.

Mr. Marrin: No further questions.

CLARK RANKIN,

Recalled for Plaintiff.

Mr. Marrin: Q. Mr. Rankin, you testified on your direct examination that you were in charge of the tunnel operations from about June 1, 1935 up till the time the operations were shut down, ex-[1669] cavation operations were shut down on August 21, 1935. At the time that you were in charge of the operations of excavation, the excavation was being carried on by the drift method. Now, in performing the excavation in the two tunnels under the method used by you, in what place was it necessary to perform blasting operations?

A. It was necessary to perform the blasting operations in each of the four drifts and one ring drift, and the core.

Q. Was the blasting done on each of those places at the same time?

A. No, it was not, not necessarily.

(Testimony of Clark Rankin.)

Q. Will you explain why?

A. Well, each drift, including the ring drift, that would make five drifts, the core would make a sixth operation, is a separate and distinct operation. During that time these drifts, due to the great variance in formations we were going through—we were going through probably several different types of rock or ground; one drift might be proceeding ahead in a fairly hard rib probably of short duration, while another drift was in very soft material, and therefore it was necessary to carry on different drilling procedures to meet the ground encountered, and each time a shift had drilled the ground we shot the ground as soon as it was drilled.

Q. When you shot the ground in one drift what was done with the tunnel crew that was working.

A. It was necessary to remove all of the men in the vicinity of the heading and for some distance back at the time any shot was fired, whether it was a plug shot, that is, a single shot, or a round in a drift, or in several drifts, or the core; that included all the excavation crew, that is, the shovel crew, motor and transportation units, etc.

The Court: We will take a recess for five minutes.

(After recess):

Mr. Marrin: Mr. Reporter, would you read the last question [1670] and answer?

(The record was read by the reporter.)

(Testimony of Clark Rankin.)

Q. How long, on the average, would the crew be out while the shot was being fired?

A. I think the average would be somewhere about half an hour, twenty minutes or half an hour, varying on the distance that they had to go out and back to the heading.

Q. How frequently did this occur in a twenty-four-hour period?

A. It occurred quite frequently during the time when I was there, due to the fact that we had these many drifts and the core, and I would say that probably five or six times a day would be a good average.

Q. When the operations were carried on under the full-faced method at what place was the blasting done?

A. The blasting was done at the face, the point of the operation, and it would amount to practically the same amount of time that was required for one drift.

Q. About how often did the crew have to be removed when the operations were carried on under the full-faced method?

A. All depending on the length of the round, and the time that it would take to muck out. It depended on the cycle that you would set up.

Q. What is the usual cycle?

A. Well, if you were shooting a twelve-foot round you would probably be able, if you had the equipment lined up for it, to shoot twice in a 24-hour day.

(Testimony of Clark Rankin.)

Q. The crew would have to be removed only twice under that method, and five or six times while the operation was carried on by the drift method?

A. I would correct that by once or twice, it is all relative to the amount of the pull and the amount of muck.

Q. How much muck was there in the space you had charge of when you were operating under the full-faced operation?

A. Practice taught us it is not advisable to shoot any further, that is, to drill and remove muck any further into the heading than the dimensions of the [1671] drift, that is, the cross dimensions of your drift; say they were 6 by 6, you would pull in the vicinity of a 6-foot round.

Q. I think there may be some confusion because I asked you first with respect to the full-faced method, and you answered with respect to the drift method.

A. In the full-faced method it is the same as in the drift; the size of the tunnel has an absolute bearing on the length of the round that you can pull; that is necessary because of the choking action of the round, when the round is shot, if you try to pull too long a round the blast chokes itself and you do not get the efficiency of your powder.

A. As I understood you, when you are operating under the drift method the length of round you can pull in one shot is limited by the diameter of the drift?

A. That is right.

(Testimony of Clark Rankin.)

Q. The sizes at the drift that you were driving were what?

A. They were a little over, they averaged a little over six feet in core section; that pulls a little over a six-foot round.

Q. And your length of six feet was limited by the diameter of the drift? A. That is right.

Q. So that in excavating under the drift method as compared to the full-faced method, considerably more delay was caused from shooting alone in the excavation under the drift method: is that correct?

A. Yes, I might clarify that point; whereas you could pull a six-foot round in a drift, if you were shooting the full face in the tunnel you could probably pull up to a 20-foot round.

Mr. Marrin: You may cross-examine.

Mr. Tinning: No questions.

STANFORD H. WILDE,

Called for the Plaintiff; Sworn.

Mr. Marrin: Q. Mr. Wilde, were you employed by the plaintiff, [1672] Six Companies of California? A. I was.

Q. About what date?

A. January 31, 1935.

Q. Did you remain with the company thereafter until it ceased work on the contract that is in litigation? A. I did.

(Testimony of Stanford H. Wilde.)

Q. Were you familiar with all of the records of the company? A. Yes.

Q. On this matter of the amount of powder used, there is a little confusion about it, and I want to clear that up by our records. Will you state what the records of the Six Companies of California show as to the amount of powder which was used in these tunnels, both with respect to the cross excavation and the neat?

Mr. Wittschen: Objected to as immaterial. I do not think in this case it is necessary to go into minute detail as to how many sticks were used and how many holes drilled. They were obviously building a tunnel, and not a lath house in the back yard, and they needed powder; how much they used is immaterial; they agreed to use all that was necessary.

Mr. Marrin: If your Honor please, I think the last witness, Mr. Hindmarsh, was slightly in error in his answer, and we simply want this record to be accurate.

Mr. Wittschen: You can call Mr. Hindmarsh and correct it.

Mr. Marrin: This witness knows the exact amount and we want to offer to the Court in good faith to show the exact amount as shown by our records.

The Court: He may answer the question. I will give you a record on it.

A. The amount of powder for the gross excavation was 1.24 pounds of powder per cubic yard of

(Testimony of Stanford H. Wilde.)

gross excavation and 1.57 pounds of powder per neat yard of excavation.

Q. By "neat yard of excavation" you mean what?

A. That is the amount inside of the neat concrete lining, in other words 35.61 [1673] cubic yards per lineal foot of tunnel.

Q. And by "gross excavation" you mean what?

A. That is the total amount of excavation we took out per lineal foot of tunnel.

Q. I show you here a document which is marked "Reinforcing steel," and if there is no objection before having the witness explain it I will offer it and give it an exhibit number, so as to refer to it in the testimony.

Mr. Wittschen: I am going to object to its offer as entirely immaterial, so that the Court may have the matter before it, so that it may rule. It is your estimate of the amount of steel that was required to be placed in the tunnel. We are not objecting to the document for the reason that it is a copy and not the original record, or anything of that kind; our objection is not technical, but in view of the fact that they agreed to put in all of the steel that was required and were paid for at the bid price, what difference would it make if they had used blank or blank pounds, whether it was 1 or 1000 pounds more or less; their contract was that they put in a certain minimum of steel, and so much more as the Engineer required as they went along. It is imma-

terial how much went in, they were paid for it.

Mr. Marrin: I think you misunderstood what this shows. It does not show anything about the pounds of steel; it shows the stations at which the steel was placed and the lineal feet between those stations, and it contains copies of the maps or diagrams which were delivered by the District Engineer to the plaintiff in this case, directing it to put that steel in at that particular place.

Mr. Wittschen: I misunderstood it to that extent, but the principle is the same.

The Court: In reference to this document is there anything in that document which has not already been gone over?

Mr. Marrin: There is nothing in the record about the amount [1674] of steel or how the steel was placed, or the design of steel that was ordered to be placed in the tunnel. The point is this, in the original plans the Type A section shows one curtain of steel placed in the tunnel. As a matter of fact the district ordered in a great deal more steel, and the testimony of Mr. Hindmarsh shows this increased the difficulties of work and slowed up the operations. On the question of unavoidable delay we think this evidence is pertinent as showing not that the District did not have the right to order it in,—we do not question that, but we did put in all the additional steel and it delayed the operations; it was a thing over which the contractor had no control. We simply want to show what the facts are with respect to the steel.

(Testimony of Stanford H. Wilde.)

The Court: What facts are you going to present to prove that?

Mr. Wittschen: Mr. Hindmarsh has already stated—

Mr. Marrin: We are going to present this document, which will show the steel that was placed, which will be in contrast to the amount of steel as shown on the original plans, which are in evidence.

Mr. Wittschen: Might I observe, putting in the record how much was placed does not show where it was placed, and Mr. Hindmarsh has already said he put in 50 per cent. more than the minimum required.

The Court: Whatever the facts may be, both sides are acquainted with the facts, and the amount of steel, and the stations; we are consuming time here. I have other work, other cases, and I am being pressed on them, and it is my purpose now to bring this thing to an end.

Mr. Marrin: I have tried to make clear to your Honor the purpose of our offer.

The Court: How long will it take to take care of this document?

Mr. Marrin: If there is no further objection it will take about thirty seconds to dispose of this witness, maybe a minute. [1675]

Mr. Wittschen: Might I observe reinforcing steel did not delay the excavation work; that is where they were delayed. This is entirely immaterial.

(Testimony of Stanford H. Wilde.)

The Court: Counsel may get some comfort out of it. That is not the difficulty I find myself in. I do not want to mislead him to his injury, however. When finally we come to meet these matters definitely there is much of the matter that we wont need here that we are wasting some time on. With that admonition you may proceed with the hope that we will come to the conclusion of this testimony.

Mr. Wittschen: I assume, your Honor will admit the exhibit?

The Court: Yes.

Mr. Wittschen: Note an exception.

(The document was marked "Plaintiff's Exhibit 99.")

Mr. Marrin: Q. Mr. Wilde, referring to Plaintiff's Exhibit 99, will you please explain briefly to the Court what that shows, just put it up there and explain it to his Honor.

A. This starts with the portal section of the north tunnel at station 111+42.55 and carries through consecutively with each station, showing the lineal feet and showing the type—referring to the District order appearing in the back—the type of steel which was placed in the arch, in the left footing and right footing.

Q. Now, will you refer to one of the diagrams?

A. In other words this A-3, which is the District sheet showing the steel which should be placed in this given section.

(Testimony of Stanford H. Wilde.)

Mr. Tinning: Q. When you say "District sheet," so that we will have the record clear, each time that there was any change in the way in which the steel was to be placed in this lining the District gave an order to the contractor and this sheet proved the detail of that order?

A. Yes; that is where these stations are broken down—each time we received a new order we broke them down this [1676] way.

Mr. Marrin: As far as you know, that is a correct record of the steel and the design of the steel that was placed in the tunnels? A. Yes.

Mr. Marrin: That is subject to your check. That is all.

Mr. Tinning: No questions.

BEN M. PAGE,

called for the Plaintiff; sworn.

Mr. Smith: Q. Where do you reside, Mr. Page?

A. 3800 West Adams Boulevard, Los Angeles.

Q. What is your present occupation?

A. Instructor in geology at the University of Southern California.

Q. Are you a graduate of any university on the subject of geology? A. I am.

Q. Where?

A. I graduated from Stanford University in 1933.

(Testimony of Ben M. Page.)

Q. What degree did you receive for that?

A. Bachelor's degree, Bachelor of Arts.

Q. Did you do further studying on the same subject?

A. I did. I returned and received a Master of Arts degree in 1934.

Q. What experience did you have during the time you were studying geology at Stanford University or thereafter up to the present time in handling geological work in the field, commercially or otherwise?

A. I did not do commercial geology, but I had field work during the four summers, during which time I did geology mapping, involving the recognition and the massing of geological features. I also visited various mines.

Q. Where were they located?

A. I was underground at Tonopah, at Virginia City, Mill City, Ione, Edgemont, and various other places I do not recall. [1677]

Q. Did you undertake to examine ground conditions for the purpose of observing the nature of the ground in those drifts?

A. I did in a casual manner. I did not make any detailed investigation.

Q. You are familiar with the practice of geologists in making a detailed examination?

A. Yes, I am.

Q. Were you employed by the Six Companies of California, the plaintiff in this case?

(Testimony of Ben M. Page.)

A. Yes, I was.

Q. When were you so employed?

A. I was employed on September 25, 1935.

Q. And what were your duties after your employment, how long did it last, and just describe them generally, will you please?

A. I was employed to make an exact observation of the geological conditions in the Broadway Tunnels and to prepare myself to describe them accurately. That work lasted until about September 24, 1936; and part of that time was spent in plotting and accumulating the material I had gathered.

Q. What was your practice with regard to taking observations? Did you make notes of what you took?

A. I did. I think I can describe that best by describing first my work during the first three months of my employment, when there was no excavation in the tunnel; the excavation had been shut down following the cave-in, and during that first three months it was my purpose to see as much as I could of the ground that had been opened up already; and in doing this I went from place to place, systematically along the tunnel wall, wherever there was an opening between the timbers or between the lagging, I carefully noted the location of that opening, both its horizontal location and its elevation between the tunnel floors. In many cases I noted also the dimensions of that exposure, and

(Testimony of Ben M. Page.)

the next step was to examine carefully the material that could be seen at this noted locality; the material was identified as to variety, [1678] its physical condition was noted, whether it was hard or soft, or strong or weak; this work occupied the first two months of my employment, till I had covered the tunnel walls as they had been opened up, and I started to carry out the same system with the tunnel arch, and did so wherever it had not been concreted or gunited in the meantime.

Q. You are referring in that answer you have just given to the time when you first went to work in the fall of 1935, and there was no excavating being done: is that correct?

A. Yes. That period lasted until late next November.

Q. In the north tunnel was it November or December?

A. I think it was November—no, in the north tunnel it was December; in the south tunnel it was November.

Q. Now, during the time that you were making this observation did you limit your examination to purely looking at the ground, or did you do further than looking?

A. During my employment, during my work in the tunnels I collected samples of the material that had been encountered. Another aspect of the work applies to the period during which excavation was going on, excavation was resumed.

(Testimony of Ben M. Page.)

Q. Just a minute, I will come to that in just a moment. Before excavation was resumed and when you were making the observations you have described you made in the tunnels which were already excavated, or in the portions which were already excavated, did you make a systematic practice of obtaining samples throughout the length, as far as you could?

A. Yes, I did. I did not obtain them at definite intervals, but wherever it seemed advisable.

Q. You tried to get a representative condition, is that it? A. Yes.

Q. Mr. Page, after resumption of excavation what was your practice?

A. After excavation was resumed I spent most of my time in the tunnels again, and I made daily rounds and visited all along the head- [1679] ing; in the heading I observed the ground as it was being drilled, after it had been blasted, during the barring down, during mucking and during timbering, and I tried to acquire first-hand knowledge of the character of the material.

Q. Was your employment during this period that you have mentioned, from December, 1935, until approximately one year later, a full-time employment? A. Yes, it was.

Q. You devoted all of your time to it? A. Yes.

Q. Did you upon the conclusion or during the period of time between the June 13 date of 1936, when the plaintiff in this case ceased work on these

(Testimony of Ben M. Page.)

tunnels and the close of your employment at that time, cause a model of the tunnel to be made which would reflect your observation? A. I did.

Mr. Smith: We have here, your Honor, a model. [1680]

Mr. Smith: For the purpose of identifying this, I will ask that it be called "Plaintiff's Exhibit 100 For Identification."

Q. Pointing at Plaintiff's Exhibit 100 For Identification, Mr. Page,—

If there is no objection, I will offer it at this time.

Mr. Wittschen: You better proceed. I don't know how far that goes.

Mr. Smith: Q. —Plaintiff's Exhibit 100 For Identification is the model that you prepared as you mentioned a moment ago? A. Yes, that is.

Q. Will you state how you prepared that and what it purports to represent? In case you wish to go to the model, don't hesitate to leave your chair.

A. This model represents the materials surrounding the Broadway Tunnels, the materials immediately adjacent to the tunnel concrete; and it was prepared from the materials I gathered, myself, underground, with the exception of a very small portion near the west portals.

Q. Was it done under your direction?

A. Yes, it was.

Q. Did you do the work yourself?

A. I plotted the geology myself. It was colored by technicians.

(Testimony of Ben M. Page.)

Q. Do you understand the scheme of the coloring as described?

A. Yes. If you care to have me, I will explain that scheme.

Q. Well, I am pointing at the plaque standing on the easel behind the model, Exhibit 100 for Identification. Will you explain what the colors purport to show, naming the colors?

A. The colors merely represent the variety of materials, much the same way as the colors of a map represent political divisions. The ground was not actually this color. I will read the legend—at least, a portion of it: "Brown on this legend indicates a formation of stream deposit, hill wash and creep. Red on this legend [1681] indicates diabase and altered diabase."

Mr. Tinning: Q. I think you better spell each geological term because the reporter cannot interfere or interrupt by looking up.

A. I will do that. "Green represents the orindan formation. Violet represents a formation of cherts and shale."

Q. Will you point out what you mean by "violet"?

A. Yes; this is violet. It appears here. Blue is such as this portion.

Mr. Smith: The witness is pointing with a pointer to portions of the model marked in that color.

(Testimony of Ben M. Page.)

The Witness: In other words, sandstone and grey which appears in the west portals of the tunnels indicates a formation of sandstone, shale and shaley sandstone.

Mr. Smith: Now, we will offer the model as Plaintiff's Exhibit 100 in evidence.

Mr. Tinning: Well, Mr. Smith, we don't want to be technical about it. However, I understand this gentleman said he personally inspected the tunnels when he was first employed in September, 1935.

Mr. Smith: Yes.

Mr. Tinning: At that time, the west end of the tunnel had been concreted.

Mr. Smith: Yes.

Mr. Tinning: And his model indicates——

Mr. Smith: His testimony will so disclose in just a moment.

Mr. Tinning: Well, it is a fact that portions of the model, at least, are taken from other information; it is not what he was able to observe.

Mr. Smith: That is correct. There is no suggestion he claims it is an accurate reflection of anything behind the concrete which was already installed when he was there. [1682]

Mr. Tinning: Will you have him show what the situation was?

Mr. Smith: Q. Will you point out, and define each station number, Mr. Page, the extent of the west end of the tunnels that was already concreted when you arrived there?

(Testimony of Ben M. Page.)

A. May I refer to some notes? In the north tunnel, the following portions were concreted prior to my arrival: from Station 111 plus 42,—that was the portal,—and to 113 plus 31; in the south tunnel, the following portions were concreted: from the portal at 111 plus 53 to 114 plus 90; and further in a few feet were concreted: from 119 plus 24 to 119 plus 43.

Q. That was in the south tunnel?

A. Yes. The total in the north tunnel was 188 feet of concrete; and the south tunnel, 356 feet.

Q. As to the concrete portion, you don't purport to represent the geological conditions of the ground behind the concrete?

A. Of course, I could see no geological exposure in those portions. I have simply indicated those portions on the model for completeness; and all my data was derived from the company records and from certain rock samples which had been taken prior to my employment.

Mr. Smith: We now renew the offer of the model in evidence.

The Court: It may be admitted and marked plaintiff's exhibit next in order.

(Thereupon, the model was marked "Plaintiff's Exhibit No. 100.")

Mr. Smith: Q. Now, Mr. Page, addressing your remarks first to the question of the status of the work when you arrived there, will you, just point out on the model and describe the station numbers

(Testimony of Ben M. Page.)

of the excavation already made when you started, just briefly, so we will know just where you started?

A. A portion of the tunnel was fully excavated as follows: in the north tunnel from 111 plus 42 to 122 plus 11; the south tunnel, from 111 plus 53 to 124 plus 57. [1683]

Q. Were there any drifts ahead of that south excavation that you just mentioned?

A. Yes, the drifts went on beyond the fully excavated portion in the north tunnel. The eastbound drift on the north side went 128 feet, from 122 plus 11 to 123 plus 39. The eastbound drift on the south side of that same north tunnel, from 122 plus 11 to 123 plus 40; and from the other portal of that north tunnel drifts had been driven westward, on the north side of the tunnel from 140 plus 18——

Mr. Smith: The witness is now pointing to the east portal end of the model.

A. —132 plus 23; and on the south side of the north tunnel, the westbound drift had been driven from 140 plus 18 to 131 plus 92. The following are the drifts in the south tunnel as they existed upon my arrival: North side of south tunnel, eastbound drift extended 91 feet, from 124 plus 57 to 125 plus 48. The south side of the south tunnel, the eastbound drift went 130 feet, from 124 plus 57 to 125 plus 87. The westbound drift in that same south tunnel——

Q. The westbound drift: you mean by that the drift driven from the east portal south?

(Testimony of Ben M. Page.)

A. Yes.

Q. Eastbound drift: you mean drifts driven from the west portal?

A. Yes. The westbound drift in the south tunnel extended on the north side from 140 plus 97 to 131 plus 30; on the south side of the south tunnel, from 140 plus 97 to 131 plus 31.

Q. All the figures that you have mentioned or used in the answer as to location of drifts or of the full excavation, refer to the station numbers on the engineering station lines of the tunnels?

A. Yes, they do.

Q. You made yourself familiar with those station numbers and knew what they were?

A. I did. [1684]

Q. In connection with this particular model, have you got a line or legend on it which reflects the station numbers that you have been mentioning in general?

A. Yes. The model includes station numbers at intervals of 100 feet, alongside each tunnel.

Q. What were you pointing out then?

A. I was pointing to one of the station numbers.

Q. Well, you are in general pointing out a white strip which is alongside the line of the north tunnel?

A. Yes. There is a similar one alongside the south tunnel.

Q. What is the character of the information contained on these white strips which are tacked down on the floor of this model?

(Testimony of Ben M. Page.)

A. In addition to the station number, there is a white strip alongside each tunnel which makes comments on the physical condition of the rock or ground, and, furthermore, across that, the quantity of data that was available for me during my studies.

Q. And in making that comment, does the comment itself have a defined area as to the part of the tunnel that is covered by the comment,—the tunnel ground?

A. Yes. This description alongside of each tunnel indicates the extent of each comment as it applies to each tunnel line.

Mr. Tinning: In other words, is this your vertical line?

The Witness: Yes.

Mr. Smith: Q. The vertical line, in other words, projected up, covers that? A. Yes.

Q. For the benefit of his Honor, you might point out what you were just saying.

A. These are the station numbers. This strip indicates, in blue letters, certain physical conditions of the ground, and likewise, in black letters. The green letters indicate the source of my data, so the data can be evaluated. For instance, in the west portal, here, is a comment that this portion was [1685] concreted prior to my arrival.

Q. Show his Honor the place where the August cave-in is shown there.

A. The August cave-in is indicated on this white card alongside the north tunnel. The vertical red

(Testimony of Ben M. Page.)

line indicates the extent. There is a similar card for the other cave-in, namely, the cave-in of February 22, 1936, and the cave-in of February 11, 1936.

Q. Pointing to the cave-in which occurred in the east end of the north tunnel? A. Yes.

Q. The last remark you made? A. Yes.

Q. Will you state, for the benefit of the Court, what this geological model shows as to the condition of the ground in the north tunnel, beginning at the west portal? A. Yes, I will do that.

Q. And, in making your comments, you might call attention to any remarks that are contained in the white strip there as illuminative of what you are saying.

The Court: He wants to get a record of that; so you describe it.

The Witness: A. I will do that. Beginning with the west portal of the north tunnel, from that point to about 113 plus 70 the north tunnel lay within the sandstone, shale and shaly sandstone, which is indicated in grey on the model.

Mr. Smith: Just one moment. May I interrupt you? Counsel for the District asked me:

Q. What is the scale of this model?

A. This is 15 feet to the inch.

Mr. Tinning: Q. Is the height the same both horizontally and vertically,—the scale the same?

A. Yes. [1686]

Mr. Smith: Q. You may proceed.

(Testimony of Ben M. Page.)

A. The sandstone, by the way, consisted of consolidated, or partly consolidated, sand. The shale consisted of more or less consolidated silt and clay, and the shaly sandstone is an intermediate rock.

Q. What do you mean by intermediate rock?

A. It is midway between the two compositions I just gave. It contains some silt and clay and some sand.

Q. Midway in characteristics, you mean?

A. Well, at least in constitution.

Mr. Tinning: There seems to be a difference of opinion between counsel and the witness.

The Court: I trust the witness won't be interfered with. You go right ahead and give us your answers, right down the line.

A. This first formation I have referred to was a mass which, according to the Company reports, was weak and locally soft and damp, and it required support throughout. I only saw, myself, a portion of it. Beginning at 113 plus 31, my own observation showed that the material I saw was weak, and it was badly fractured and it required timber support. From about 113 plus 70 to about 114 plus 15, the north tunnel penetrated a formation of cherts and shale which I had better describe. The cherts is a rock consisting mostly of silica. It is a hard rock, a brittle rock, with some of the characteristics of glass. In other words, it is rock that will shatter under stress, and the strength depends not at all

(Testimony of Ben M. Page.)

upon its hardness but upon the degree to which it has been fractured, or upon the degree to which it has been recemented. In this instance, and, in fact, throughout the tunnel area, the cherts occurred in thin layers perhaps an inch or an inch and a half in thickness on the average. Between these layers were layers of shale which was [1687] thinner in general. The whole of this cherts and shale from 113 plus 20 to 114 plus 15, approximately, was such that the rock was very badly crushed in places, or was pulverized; so it had a tendency to slump or run into the tunnel, and it was practically devoid of strength. It was within this cherts and the adjacent sandstone just to the east of it that the August cave-in occurred in 1935. I was not present during that cave-in but the debris was still in the tunnel upon my arrival, and that debris had been penetrated by drifts which afforded exposure of the material along the tunnel walls. The tunnel walls had not caved in, so I was able to get a picture of the geological conditions at the site of that cave-in. From about 114 plus 00 to approximately 114 plus 45, the north tunnel lies in sandstone which on the whole was harder than the sandstone that had been penetrated prior to this point, but it was crushed locally and was fractured throughout, and a portion of it caved in with the cherts during that August cave-in. This sandstone I refer to required timber support throughout.

Following this, going east, there is another belt of

(Testimony of Ben M. Page.)

cherts and shale from about 114 plus 45 to about 114 plus 60 or 70. That cherts and shale was again badly fractured and weak, but it was not as weak as the material that had caved in. It, too, required timber support.

From about 114 plus 70 or 80 to about 117 plus 50, the north tunnel lies within a sandstone formation. This sandstone was hard and the sand grains—that is, in places,—the sand grains being cemented to each other by natural cement, but in many spots the apparent strength of this material was invalidated by fractures that occurred throughout. About 80 feet of this sandstone was the best material penetrated by the western part of the tunnel. Superficially, that 80 feet looked like substantial material, but close [1688] inspection revealed that it contained in places a network of fine grey lines, like pencil lines, which represented incipient fractures. A microscopic study of that material showed that the sandgrains had in many cases been crushed. Fortunately, some had been recemented by natural processes. With the exception of the 80 feet I mentioned, the remainder of this sandstone was not particularly strong, even superficially, and the whole mass, including the 80 feet, required timber support for safety.

After about 115 plus 90, an oblique crushed zone crossed the tunnel and rendered that portion of the arch very weak, so it was supported with square sets as well as with the usual timber.

(Testimony of Ben M. Page.)

At about 116 plus 90, diabase,—which I have indicated in red—diabases enter the north tunnel at the south side, and run obliquely across to the center line; and this diabase should now be described.

A diabase occurs in other parts of the tunnel. Its character varies widely, depending on the location. In some cases, the material was very hard; in other cases, it was almost devoid of strength. I think it is necessary, in this instance, to mention the origin of diabase. A diabase is an igneous rock, with a characteristic texture. That is a loose definition. By "igneous rock" is meant generally what is formed from a molten material,—a melted material,—which has cooled and consolidated. These diabase bodies came up from below, from the depth of the outer earth and filled cracks in the very rocky material and consolidated there. Bodies of this sort are termed "dikes," so I will refer to them as "diabase dikes." [1689]

Mr. Smith: Q. This is one shown in red?

A. Yes. This first diabase dike was partly black and firm, but many of the other diabase dikes throughout the tunnel varied widely from this, from that which had been altered; and, by alteration, I mean that the material has been changed by chemical processes so that in many cases the original hard constituents have been rendered soft and weak. In fact, some of the dikes were almost completely altered so that their original nature was obscured.

The diabase which entered the tunnel near 116 plus 90—

(Testimony of Ben M. Page.)

Q. Referring to the north tunnel?

A. —extended to the center line of the tunnel. Throughout part of this area it was firm. Throughout other parts it was very soft. In every portion, it had been crushed and fractured and the soft qualities near the center line were accentuated by the presence of much water at that point and by the presence of an adjacent body of rock, which I will describe in a few moments; so that that portion of the north tunnel was weak.

At about 117 plus 60, and from then onward for a few feet, that portion was partly gunited as well as supported by timbers.

From about 117 plus 50 to about 129 plus 90 in the north tunnel, much of the material was cherts and shale, although, as you can see from an inspection of the model, it was not a continuous cut of cherts and shale; possibly some rock. The same statements I have made regarding cherts and shale in this first belt that was encountered applied to the rest of the material except that the amount of crushing varied from place to place. In general, it was not crushed quite as badly as it had been at the site of the August cave-in. Here again the cherts and shale occurred in alternating layers, and in general throughout this area those layers trended almost at right angles to the tunnel line and they dipped or sloped [1690] rather steeply toward the west portal. This situation was an advantage to the Engineer.

Q. When you say they sloped toward the west

(Testimony of Ben M. Page.)

portal, in what direction did they slope; was the bottom of the slope toward the portal?

A. Yes.

Q. And the top away from it?

A. Yes. The general structure that I have indicated is only a generality. In most places, it bent. However, some bent so they were no longer planes; and in some places that bending was inclined quite acutely. The bending of the cherts strata involved a certain amount of fracturing, since that cherts is a very brittle material, and the fracturing was present wherever those layers were bent. It was also present in other situations.

I will continue now with some of the details of the north tunnel: The first part of this cherts and shale that was encountered was rather badly crushed and weak, as you can see. The first portion contained diabase dikes, indicated in red; and these dikes in most instances were very soft. They were almost completely altered. In place, they were plastic,—actually plastic, like modelling clay,—so the material could be grabbed out with the fingers and squeezed between the fingers. It was affected by water. Its plastic nature was most apparent when it was moist.

All the dikes except those I will mention otherwise were very largely altered and were soft. They were not all plastic, but they were all weak. The cherts and shale, with the diabase that was inspected from Station 118 plus 00 to 119 plus 00, was quite

(Testimony of Ben M. Page.)

heavy ground; by that, I mean ground exerted pressure on the proximity of the tunnel.

From 119 plus 00 to about 122 plus 35, the cherts and shale were here, again, badly fractured in places,—very weak. Here, [1691] again, there was some very soft diabase dikes; and at least two or three of those dikes were well exposed on the face of the core during the long suspension of excavations following that first cave-in; so many visitors to the tunnel saw those diabase dikes.

The Court: We will now take a recess until two o'clock.

(Thereupon, an adjournment was taken until two o'clock p. m., this date.) [1692]

Afternoon Session
BEN M. PAGE,

recalled.

Direct Examination (Continued)

Mr. Smith: Q. Mr. Page, will you resume, substantially, where you stopped at the adjournment for noon, and continue with your description of the north tunnel?

A. Yes, I will. I was describing the territory between Stations 119 plus 00 and 122 plus 35 in the north tunnel. I had called attention to a soft, altered diabase dike that occurred intermittently in that area. The cherts and shales themselves were locally

(Testimony of Ben M. Page.)

in a shattered condition and in themselves, in places, they were unstable also. The cherts and shales were not only penetrated by the diabase bodies but also by certain bodies of sandstones which had the physical character of the sandstone that I described between 115 and 117, approximately; so that has been indicated in this case by the same color that was used for that other sandstone shown in blue on the model.

One portion of the sandstone in the area under discussion near 120 plus 00 was better ground than the adjoining material. However, in some cases the sandstone bodies were not so favorable. I will say more about those in a few minutes.

From 122 plus 35 to about 123 plus 82, the cherts and shale were again locally crushed and they were again penetrated by bodies of altered diabase which assumed an amazing variety of forms and positions in the tunnel. These diabase dikes did not run in general parallel to the layers of cherts and shale. On the other hand, in most cases they cut across these layers at various angles and the haphazard arrangement of these bodies, in itself, was a hazardous feature. For instance, where these bodies more or less followed the tunnel line, they rather effectively removed the bond between the several portions of the arch, or between the walls and the arch. [1693] Between the wall and the arch—a case in point occurred between 123 plus 00 and 123 plus 80 or 90, where one of these bodies followed the tunnel wall

(Testimony of Ben M. Page.)

in an extremely irregular position. The diabase in that particular instance was not as plastic as some of the other diabase; it was not as soft; but it was weak, and that, coupled with its position in the tunnel, made that area very unstable. During my employment, excavations had to be stopped while the movement of the timbers into the zone was checked with gunite and with concrete.

From about 124 plus 00 to 126 plus 00 there was only one diabase dike. It was a soft one. At about 124 plus 25 or 30 was where it was located, and it ran almost parallel to the tunnel line. Except for this, the cherts and shale were comparatively good in that area. The layers were not particularly distorted; in fact, they were almost planes; and the crushing was not so pronounced. Although there were many fractures, altogether that section was the best cherts and shale that was penetrated in the entire north tunnel.

Mr. Tinning: Q. Mr. Page, do I understand that you are referring now to the section between 123 plus 00 and 123 plus 80?

A. No. I have gone on to another area; this is between 124 plus 00 and 126 plus 00. I have called attention to the fact that in those cherts and shale were locally affected by the presence of a soft diabase dike. Throughout this better portion of cherts and shale, the ground did require timbering for safety. It was not extremely heavy ground; but I

think it did require timbering from a safety standpoint.

At about 126 plus 00, a faulted condition was encountered in the cherts and shale, which persisted intermittently to about 128 plus 00. [1694]

At this point, I had better explain a fault, briefly:

A fault can be roughly defined as a fracture along which displacement has occurred; and the displacement, by the way, usually involves some granulation of the rock on either side of the fault. Sometimes rocks are merely badly crushed, and sometimes they are drastically crushed,—reduced to a pulverized mass. In some cases, the fault produces somewhat of a mechanical rock flour, which is plastic when wet. It is called a fault gouge,—a claylike material.

In the tunnel area, there were two main classes of faults: one of them ran parallel to the beds of cherts and shale; and, in this variety of fault, there was no granulation of material to speak of. This fault gouge was developed in thin layers, perhaps only half an inch or an inch or two inches. On the other hand, some of the faults ran across the cherts and shale, and, in this situation, they had a more disastrous effect. We have more granulation of the cherts and shale. The faults on this model are indicated by heavy black lines, as explained on the legend. Near one of these faults, at about 126 plus 00, a run occurred during which this shattered cherts poured into the tunnel. I was not present at the time that it happened; it happened at night; but that was during my employment.

At about 126 plus 70, a portion of this faulted area was partly occupied by a diabase dike of particular importance, and the diabase was largely altered material. On the other hand, it was not a plastic material; it was largely brittle; it was not as soft as many of the other dikes that had been penetrated in the previous part of the tunnel, but in spite of its apparent local brittleness, this material forced the timber in and gave rise to the cave-in on February 22, 1936, and that diabase and the adjoining or adjacent cherts and shale fell into the tunnel and filled it up.

By the way, I was present during part of this cave-in, and it [1695] was witnessed by me, although I missed the first stages; I came to the scene of the cave-in about two hours after it had started, and it was still in progress. At that time, there was a huge pile of debris on the south side of the north tunnel; this debris being largely the altered diabase. It was very light-colored,—almost white, in comparison with the cherts and shale; and a large part of the debris consisted also of a pulverized cherts and shale.

I did not detect any water in that material. Apparently, it had the usual moisture that is encountered underground. Shortly after my arrival—the cave-in continued from time to time, perhaps at intervals of 15 or 30 minutes; tons of material would crash down, temporarily stopping the work of building a bulkhead; and finally, after more arch timbers had crashed and after the debris had filled the tun-

(Testimony of Ben M. Page.)

nel up beyond the normal walk, or the normal roof of the tunnel, the tunnel filled up, and from that time on the caving was more spasmodic, although it continued off and on for many hours,—for more than a whole day.

Beyond that point, the cherts and shale were in better condition. From about 128 plus 00 to about 129 plus 00, it was better, although there were a few faults. From about 129 plus 00 to about 130, the ground was again cut by a soft diabase dike, which, in this instance, was largely very soft, although it was smaller than the previous one. This dike had a most irregular shape. It has been carefully plotted on the model. In addition to it, sandstone bodies occurred in the shale and cherts; and these sandstone bodies were also irregular,—assumed various shapes and various positions.

At this time, I want to explain the nature of those sandstone bodies which occurred off and on throughout the western part of the tunnel. I will refer to it as "sandstone dikes," although the term "dike" is usually confined to an igneous rock; but occasionally [1696] sedimentary rock assumes the same relation as an igneous dike, and they are then called sedimentary dikes.

These sandstone dikes, like the diabase, in many cases cut across the surrounding strata. They were not necessarily parallel to the cherts and shale; some of them went almost parallel to the tunnel and at right angles to the cherts and shale. In this area,

(Testimony of Ben M. Page.)

as I mentioned, from 129 to 130 in the north tunnel, some of those sandstone dikes followed the arch and had the effect of dividing the arch in half. The dikes themselves were not always an obstacle. In many cases, they had no perceptible effect upon the tunneling. In some cases, they are hard and brittle. In other cases, they were well fractured; but, more important, they lacked a good bond with the surrounding material,—a good contact between the surrounding material and the sandstones, which were often focal points of weakness, and often they were focal points of dampness, since, in so many cases, water drips occurred along them.

The orindan formation was encountered in the north tunnel at about 129*plus 00. The contact there between the cherts and shale and the orindan formation, however, had been offset by a fault about 14 or 15 feet. That fault added to the instability of the ground. A portion of that ground was gunited by the Highway Department after the Six Companies withdrew from the job. Further on in the orindan formation was an area of locally heavy ground where the ground gave pressure upon the timbers; that occurred between about 133 plus 50 and 134 plus 30. In this locality, there were many steep fractures that occurred in the rocks which ran about parallel to the tunnel, or made an acute angle with the tunnel.

Further on, at 134 plus 60 to about 134 plus 90, there is more diabase in the north tunnel. In this case, however, the diabase was not thoroughly al-

(Testimony of Ben M. Page.)

tered. It was a hard rock and a brittle [1697] material, and I suppose its only detrimental effect was its position just about parallel to the tunnel wall.

In addition to those points that I have referred to, the orindan formation, there was another locality in that formation that was wet at least part of the time and soft and weak while in that condition. I will mention some of those localities: from about 131 plus 30 to 131 plus 55; from 133 plus 10 to 133 plus 25; from 135 plus 50 to 136 plus 15; from 137 plus 00 to about 137 plus 15; from 137 plus 85 to 137 plus 95; and from about 138 plus 55 to about 139 plus 40.

Mr. Smith: Q. Those stations you have just mentioned are the locations of the wet places you spoke of?

A. Yes; those are the spots which were wet at least a part of the time, and were soft and weak while in that condition. At this latter spot I mentioned, near 139 plus 40, a portion of the orindan formation softened during heavy rains of February in 1936, and caved in to the timbered drift, filling up a small portion of the drift,—about 12 or 13 feet.

Aside from those designated portions of the orindan formation, the formation on the whole was not particularly bad ground; that is, relative to some of the other materials that had been penetrated. However, throughout, it did require timber support, and the wet places and unstable places that I enu-

(Testimony of Ben M. Page.)

merated were extended during those heavy rains so that large portions of the drifts in that formation showed signs of timber strain during the storms of the winter of 1936. Shall I proceed to the south tunnel?

Mr. Smith: Q. Have you concluded your observations on the north tunnel? A. Yes.

Mr. Tinning: May I ask Mr. Page one question?

Mr. Smith: Certainly. [1698]

Mr. Tinning: Q. Mr. Page, with respect to the winter of 1936, you mean the winter of 1935 and '36?

A. Yes; the storms I refer to, I think, started at the end of January and continued into February, 1936.

Mr. Smith: Q. Have you concluded your running description— Is that all you wanted to ask, Mr. Tinning?

Mr. Tinning: Yes.

Mr. Smith: Q. Will you proceed to give us the same review or resume of your model for the south tunnel?

A. Yes, I will. This will be briefer, because we have already discussed many of the materials that were encountered in both tunnels.

One of the materials that was met with on the south tunnel—

Q. You are starting at the west portal of the south tunnel?

(Testimony of Ben M. Page.)

A. Yes. One of the materials which occurred in the south tunnel was deposited stream material and hill wash and creep which I did not see personally but its presence I gathered from the progress report. That material occurred in the roof of the south tunnel from about 111 plus 52 to 112 plus 90. I know nothing at first hand about that material, although it was referred to in the progress report as "mud." The reason for its presence is the occurrence of a stream channel overlying the south tunnel. This stream channel slopes down toward the west portal and intersects a portion of the south tunnel roof. The bedrock underlying these stream deposits and extending beyond there, from 111 plus 53 to 114 plus 15, approximately, was the series of sandstones and shale and shaly sandstones which had been penetrated in the north tunnel at a similar position. Again, I did not see this material at first hand. By the absence of any details on my model, it is not meant to imply that no details existed there. [1699]

From 114 plus 15, approximately, to 114 plus 25 or 30, the south tunnel penetrated the first belt of cherts and shale. Although I did not see it myself, the progress report states that that material was pulverized; that spiling had to be driven, and breastboarding had to be maintained throughout that belt.

The next formation I did see, I studied carefully, was sandstone, indicated in blue. That occurred

(Testimony of Ben M. Page.)

from about 114 plus 25 to about 117 plus 50. This sandstone was similar to the sandstone that was indicated in blue on the north tunnel; but, on the whole, it was more highly fractured than the similar area in the north tunnel. On the whole, it was not even superficially as good ground as the corresponding ground in the north tunnel where they had these 80 feet of good sandstone.

One element that led to the weakness of this material was the presence of numerous soft seams of claylike material which occurred here and there in the arch. These seams are not everywhere on my model, because some of them I only saw in one spot and did not know where they went from there. Another element that led to the instability in this area was a very large, or comparatively large, diabase dike that ran down the center line more or less and left the tunnel at the north side. Fortunately, that dike was not thoroughly altered. It was not soft material; it was firm and brittle; but, on the other hand, in many places it did not have a good bond with the surrounding rock. It had the effect in some spots of cutting the arch into two parts. Also, it was more or less fractured. [1700] All of these materials in this area required timber support. The diabase required about the same support that the sandstone did. From about 117+50 to approximately 130+70 a large portion of the ground was cherts and shale, although here, again, the cherts and shale were not in a continuous body. I

(Testimony of Ben M. Page.)

will subdivide it and deal with each portion. From about 117+50 to 119+00 this cherts and shale was locally very badly crushed and in places it was wet; it was unstable ground, quite weak, required timbering, and it was gunited as well as timbered. It was largely supported with square sets and with gunite as well as the usual timber. From 119+00 to 120+00, a small part of that had been concreted before I came, but the remainder was timbered so the exposures were very few. In those exposures I did see the material was very badly crushed, it **looked like a weak material.** From 120+00 to about 120+75 sandstone was encountered, this sandstone being better than the other nearby rock, although it required timber support, this whole belt of cherts and shale, about 20 or 30 feet in thickness, then more sandstone from about 121+00 to about 121+50. In this sandstone and in many of the other sandstone bodies there is a peculiar phenomena, although the sandstone was solid, that is, it was at least firm, it contained fragments of cherts and shale that were isolated in it, as though these fragments had been held back in the emplacement of the sandstone. From about 121+15 to 122+15 a diagonal fault crossed the south tunnel. This fault was bordered and followed by a soft diabase dike, making that portion of the tunnel rather weak. From 122+15 to about 123+20 the cherts and shales were in slightly better condition. Locally there was heavy ground there. All of this required

(Testimony of Ben M. Page.)

timber support. From about 123+20 to 123+90 a very serious weakness occurred in [1701] the tunnel, due largely to a diabase dike that again was soft and rather plastic, and that area was so weak that it was not only timbered but was gunited as well. From about 124+00 to 125+90 the cherts and shale were in slightly better condition, but here again diabase bodies occurred at various angles and various positions, and in various degrees of consolidation. Parts of these bodies which were very soft were well exposed in the face of the core in the south tunnel during the long suspension of excavation that followed that first cave-in. These bodies were seen by many visitors to the tunnel. It might be well at this point, since I think that is really the first showing of diabase, to state that it is a difficult rock to recognize, because the alteration is not very commonplace, at least not that variety of alteration, and when I first saw the material I thought it was fault gouge, since you could stick your fingers in it; it was just like a stiff mud which could be molded in the hand.

Q. When you say "altered," what do you mean with reference to the character of alteration over a period of time?

A. I see your point. The alteration of the diabase has occurred during unknown years, perhaps 100, or 1000, or a million years, by chemical processes that had gone on in the outer part of the earth. This is a very slow process.

(Testimony of Ben M. Page.)

From about 125+00 to 125+80 or 90, one of these diabase bodies follows the south wall of the south tunnel. In most parts it was not a plastic material, it was a weak material, considerably sheared and fractured, and its position alone in the tunnel weakened the whole structure. The effects of these bodies of diabase are not confined to the diabase, itself, the effect extends into the surrounding rock. The effects of the fracture are greatly out of proportion to the size of the dikes, themselves, so a small dike, if it has an unfavorable [1700] position or if it has an unfavorable consistency, can weaken an entire area of the cherts and shales; the irregularity of these bodies was one element of their hazardous nature. It could never be prophesied when they would be encountered during the driving and sometimes one tunnel would go through diabase and the other tunnel would not; these bodies could not be prophesied from one tunnel to the next; sometimes the left wall of the tunnel would go through diabase and the right wall would not, or sometimes the left wall of the drift would go through diabase and the right wall of the same drift only six or eight feet away would be in another material.

From about 126+00 to 126+40 the cherts and shales were crushed and rather weak, although they are not pulverized; the bed, superficially, did not look much disturbed, but a close inspection showed that the cherts were fractured to a considerable degree.

(Testimony of Ben M. Page.)

From a point about 126+40 to about 128+60 the cherts and shales were not as highly fractured as hitherto in the south tunnel, and the beds were not as highly deformed, and that on the whole was the type of area of cherts and shales that was penetrated in the south tunnel. That area required timber support for safety, although it is impossible to prove whether or not they would have stood without the timbers; they certainly without doubt did require timber for safety, even in the best portion.

It is my intention to give a fair picture of this cherts and shale, and I do not intend to over-emphasize the weakness that occurs in them, but there is a fracture, at nearly every point, it is a degree of fracture that occurs along the layers of cherts; in many places these are divided into a series of small prisms by fractures that go at right angles to the layers, and these prisms may be half an inch across the juncture or an inch across, or there may be five or ten of them to the square inch. The strength of the rock depends largely upon that degree of fracture; also it depends upon the condition of the intervening layers of shale that usually alternate with the cherts. The shale, on the whole, is not as badly fractured as the cherts layers, but where it is the whole mass lacks sufficient strength.

[1703]

At about 128+80 there is soft altered diabase crossing the south tunnel in extremely irregular condition; that diabase weakens the arch. It was a soft mass in most places, although in spots it was brittle.

(Testimony of Ben M. Page.)

The irregularity of that body suggests this fact, since that body varies in width from a few inches to several feet, it suggests that many of these bodies may expand and bulge out just above the tunnel or just to one side of the tunnel, and by that means affect the whole structure of the tunnel, although this body, itself, appeared small within the excavation, itself; and that, coupled with the irregular distribution of the dikes suggests another fact, in many places where there was pressure on the timber in the cherts and shales for all we can tell there might have been diabase bodies outside of the excavation that were never penetrated, but which lent their effect to the rock that was penetrated. Some of the masses were so soft and so plastic that they had this additional effect, they could be regarded as surfaces of lubrication upon which the surrounding rock could skid or slip. By the way, that last portion there where the diabase dike occurred at 128+90, was gunited as well as timbered.

From about 129+00 to about 130+70 the cherts and shale were cut by several sandstone dikes which in this case were distinctly unfavorable, at least most of them; the sandstone in places was crushed, and, more important, the adjacent cherts very often was crushed and had no cohesion to these sandstone bodies, and some of these masses of sandstone were literally almost plastered against the wall [1704] of the tunnel, running almost parallel to the tunnel rather than across it, as normally sandstone layers

(Testimony of Ben M. Page.)

would; sandstone layers normally would occur interbedded between cherts and shales. In addition to these facts, another feature comes here of a fault which runs obliquely across part of the south tunnel; that fault, added to the unsafety of the ground, and along it there are several persistent water drips.

Q. What is the approximate station of the fault?

A. The fault is in the vicinity of 129+50. And entering the tunnel on the north side at about 130 plus 70 the Orindan formation was encountered, and that juncture between the Orindan and the cherts and shales was rather an unstable contact; some movement had occurred between those two formations in the geological past and there is not much cohesion between the two formations, and at that locality there is a very persistent, although rather small, flow of water that continues right up to the pouring of the concrete. This area was gunited as well as supported with timbers. Further on in the Orindan formation of the south tunnel, from about 135+20 to 136+00 there was an area of local heavy ground with steep fractures made at an acute angle with the tunnel. That area was partly gunited by the Highway District after the Six Companies quit and was partly gunited by the contractors who finished the tunnel.

Again, in the south tunnel there were portions of the Orinda formation that were wet, at least a part of the time, and were soft and unstable while in that

(Testimony of Ben M. Page.)

condition. I will enumerate some of those areas. From about 131+80 to 132+25; from about 133+00 to 133+30; from about 133+70 to 133+85; from about 134+15 to 134+30; from about 135+00 to about 135+15; from about 135+20—I have already mentioned that area, pardon me. I mentioned it in connection with the steep fracture. From about 136+30 to about 136+55; from about 137+50 to [1705] about 137+65; from 138+15 to about 138+30; from 139+5 to about 139+40; and from 139+80 to about 139+90.

During the heavy rains I previously mentioned that occurred in January and February of 1936 the areas of wet spots and the areas of heavy ground were not confined to those portions I have just enumerated. Except for these designated parts of the Orinda formation the material was not particularly bad in the south tunnel, at least in comparison with the cherts and shale which had already been penetrated, but throughout this formation timber support was required.

Q. Have you concluded your description of the south tunnel? A. I believe I have.

Q. You can resume your seat there if you wish. To ascertain the accuracy of your observations upon the character of the material, did you make any laboratory studies of the materials and specimens?

A. Yes, I did; some of the more important rocks were examined under the microscope and where necessary my field identifications were altered and in other cases they were confirmed.

(Testimony of Ben M. Page.)

Q. With reference to the diabase dikes, it is my understanding of your testimony that they had a marked effect upon the surrounding structural rock, on its strength, etc.?

A. Yes. I think perhaps in many respects they were most significant and the most important geological feature in the tunnel area. Their effects were very widespread.

Q. What effect did they have on the adjoining cherts where they were in the cherts?

A. If I may use the blackboard I think I can indicate that with a sketch. The effect of these dikes is not confined to the fact that many of them were weak and soft in themselves. Their effect extended to adjoining bodies. I am drawing now a cross section, a hypothetical cross section along the center line of the tunnel at no particular spot, and I am drawing [1706] two horizontal lines here to represent the cross section of the roof of the tunnel and cross section of the floor of the tunnel. I am now drawing parallel lines to show the bedding of the cherts and shales that adjoin that excavation. That was inclined chiefly, as I have shown. The diabase dikes in general did not follow a bedding between the cherts and shale; on the other hand, a more typical case was this; this illustrates no particular part of the tunnel, it is merely a generality. A diabase dike might occur in this fashion, an extremely irregular shape.

(Testimony of Ben M. Page.)

Q. The witness has drawn some irregular lines crossing the straight lines that he had previously drawn.

A. It might pass through this cherts and shale, like appears in this white area. In such a position a small dike a few feet in thickness might affect a large area here where cherts and shale had left virtually very little actual support. All of this mass of rock is removed from any bond with the surrounding rock.

Q. When you say "all of this mass of rock" what are you referring to?

A. I was referring to the cherts and shale underneath the diabase. The diabase is inclined and some cherts and shale will be underneath. Now, if I may draw another sketch I can illustrate another effect by showing a cross section of the tunnel. This represents a profile cross section of one of the tunnels at no specific point. Cherts and shale extend across the tunnel, dipping toward a course which cannot be indicated, but the diabase in many cases runs parallel to the tunnel, across these layers of cherts and shale, and in some cases these dikes occur in this position, extending outward at right angles to the blackboard, and assuming that dike was a soft dike or of less cohesion than the adjacent cherts; with those whole mass of cherts and shale over the arch of the tunnel has very little natural support on that particular side [1707] of the tunnel. Those are a few of the cases that occurred.

(Testimony of Ben M. Page.)

Q. I believe you said in your description of this material diabase, as you were going through the description of the model a few minutes ago, that you were going to say something about the origin of that material. I do not think you did.

A. I did in a brief way. I said that the diabase was a material which had originated from a molten mass, from a melted mass which cooled and consolidated and prior to its consolidation, this molten material had forced its way into the cracks or fissures in the surrounding rock.

Q. Continuing with your comment upon the model Exhibit 100, you did not give any description of the nature of the Orinda formation. You just mentioned it without describing it. What was its general nature?

A. The Orinda formation consists largely of clay silt stone, which is more or less consolidated mud without very apparent laminations. It consists also partly of sandstone and partly of conglomerates which is more or less consolidated gravel. The Orinda formation has very little cement between the particles that compose it. It has very little natural cement, and it contains a little clay, in places quite a bit of clay, and for those reasons it is very subject to the effect of moisture, it tends to soften when it is wet.

Q. I show you, Mr. Page, Plaintiff's Exhibit 87, Subdivision 1, in evidence in this case, which is a photograph which has been put in the case before

(Testimony of Ben M. Page.)

you testified or attended this hearing, and I will ask you if the lighter colored material in the center of that photograph is the diabase material that you have been describing? A. Yes.

Q. Is that the material which you saw in that particular shape and formation at the point of the cave-in of February 22, 1936?

A. Yes, that is exactly what I saw when I got to the cave-in. [1708]

Q. You recognize it as a photo of that?

A. Yes.

Q. Was there any mention made in the geological report of Dr. Louderback of the presence of diabase dikes?

Mr. Wittschen: Objected to as immaterial, and calling for the opinion and conclusion of the witness, a matter that speaks for itself. The report is in evidence and he is not the one to interpret it. It has to stand or fall on what is in it.

Mr. Smith: Technical terms technically used are subject to definition by people that understand them, and it is undoubtedly perfectly proper for a witness skilled in geology to testify as to whether or not there is any mention made in a report, which is geological in character, of the existence of different materials.

Mr. Wittschen: The Court will be able to interpret the report, I take it; it is in English that can be understood.

The Court: Read the question.

(Testimony of Ben M. Page.)

(Question repeated by the reporter.)

Mr. Wittschen: I want also to add to my objections previously made that under no circumstances is the report of Dr. Louderback part of the contract in this case.

Mr. Smith: The report is in evidence and the witness is entitled to testify as to whether the language of that report states the presence of this material, because of the fact that it is a technical report upon a technical subject, and the witness is qualified to explain it.

Mr. Wittschen: I do not think so. The report needs no explanation, it is readable.

The Court: The report will have to speak for itself. However it may be, aside from the fact that the Court may have to struggle with it with reference to the language indulged in on the geological side, to my mind it will not be helpful on the merits of this case. [1709] The geological report of Dr. Louderback is here. What can this witness add to the fact that will assist the court? However, he may answer subject to the objection, and a motion to strike.

Mr. Wittschen: Exception.

A. No, the diabase was not mentioned.

Mr. Smith: Q. Was the presence of sandstone dikes which you have described mentioned?

A. No, it was not.

Mr. Wittschen: Just a moment, Mr. Witness. I make the same objection on all of the grounds

(Testimony of Ben M. Page.)

previously stated. The report is in. It mentions certain things, it mentions fractures, it mentions formations, and I do not think that report can be picked to pieces by any particular witness. It will have to stand or fall by itself.

The Court: The Court has so indicated.

Mr. Smith: The very way that counsel frames his objection it appears that he may contend that the report does. This witness is entitled to testify as a person trained in this subject-matter which is described in the report, as to whether it is mentioned or indicated in there; he can interpret a scientific report upon a scientific subject and he is able to do so, and can aid the Court in the interpretation by his opinion.

The Court: I do not think it is so vital to the case or the issues or merits of it as would be indicated here. That is the Court's view. I want to acquaint you with that. I have allowed considerable latitude in this case. There has been considerable preparation for the case in anticipation of coming to court; that is obvious. I want to give both sides a proper opportunity, but I do not want to mislead you. I am inclined to convey to counsel on both sides that much of the matter that has gone in here will not affect the merits of this case. [1710]

Mr. Smith: So that your Honor will have the record clear as to the exact purpose in offering the testimony, I would like to make a brief summary of the chain of proof that we feel is made by this sort of testimony.

(Testimony of Ben M. Page.)

The Court: Proceed.

Mr. Smith: In the first place, they called for bids, and held out information to the bidder, and among the information held out the report compiled by a man who is undoubtedly qualified to make such a report, and the attention of bidders is directed to such report, and it is furnished to them by the District.

The Court: Will you pardon me just a moment? The answer to that is it is not a part of the contract.

Mr. Smith: Will your Honor allow me to finish the statement?

The Court: Yes.

Mr. Smith: I had hoped that we might convince you that it is a very material element on two angles of the case, as we are seeking to present it to your Honor, and perhaps from our lack of ability to present it properly you have not got our viewpoint.

The Court: Don't waste your time on lack of ability.

Mr. Smith: The situation is this, the plaintiff comes in and gets this report, and it is in evidence that the report was used by the men who estimated the job for the plaintiff, and the job being estimated on the basis of the report, it was offered as one of the pieces of information, including the specifications, and a pertinent document which influenced the plaintiff's bid; on that theory the plaintiff planned the work and went ahead. On the theory of misrepresentation alone it would be ad-

(Testimony of Ben M. Page.)

missible. We have another theory which makes it admissible also, upon which we stand. We certainly, even if you hold or would assert that the geological report is not a proper part of the proof in this case, because it is not a proper [1711] part of the contract, nevertheless it would be admissible for the purpose of showing that a condition was expected from the standpoint of execution of the contract in the contract time, a positive representation.

The Court: I can see where there are phases of this that the Court can consider it. I limited my answer to you on the contract. It is not a part of the contract.

Mr. Smith: While conceding it is not part of the contract, it certainly is a representation that induced the making of the contract. There is ample authority that it becomes a warranty.

The Court: You can argue that at the proper time.

Mr. Smith: The evidence has to be in in order to argue it.

The Court: But we have the geological report here in its entirety. Now, going beyond that it seems to me it does not serve any purpose.

Mr. Wittschen: We did not object to the physical questions. They all went in with this witness and others, but we do strenuously object to this witness construing that report. We object to it on two grounds, one that it is not part of the contract, as the Court said, and, secondly, it never was a repre-

(Testimony of Ben M. Page.)

sentation. At the proper time we will be prepared to answer Mr. Smith's statement that this amounted to a warranty. It did not amount to a warranty, because warranties have to be in the contract, and I stand on the objection, that what this report contains is a matter for the Court to interpret. The Court can read the report and determine whether it mentions sandstone or not. It does not need this witness to state whether sandstone or diabase was mentioned. Those are all susceptible to anyone who understands the English language, who reads the report.

Mr. Smith: I think the geology report is one of the things [1712] that you can receive information about.

The Court: As I have said, I do not think it serves any useful purpose.

Mr. Smith: Has the Court ruled?

The Court: Read the question.

(The record was here read by the reporter.)

The question was answered. Let it stand.

Mr. Wittschen: Exception. [1713]

Mr. Smith: Q. Was the ground, as you observed it, in the tunnels of such character as to require support throughout?

A. Yes, it was.

Q. Regarding the cave-in of February 22, 1936, which I believe you stated you arrived at a few hours after it occurred, have you approximately the measurements of the diabase at that point?

(Testimony of Ben M. Page.)

A. Yes. I have measured that dike at several places. The north walls of the tunnel where it was first encountered——

The Court: Q. He had in mind this cave-in—the quantity of this cave-in.

Mr. Smith: I asked him if he had measured the diabase at that point.

The Court: The point of the cave-in.

The Witness: Yes.

Mr. Smith: Q. Will you state the measurement of it at that point, approximately?

A. Well, I will have to begin from the beginning. The dike varied throughout in width.

Mr. Tinning: Mr. Smith, may I ask Mr. Page a question? Isn't it a fact the diagram that Mr. Page has put on to this model, —that can be determined from the scale here of the dimensions of the dike, as he observed it?

Mr. Smith: Well, I would think the Court would not stop to measure it with that scale.

The Court: Have you the measurements there?

A. Yes, I have.

Q. What are they?

A. The dike was about 3 or 4 feet wide, when it left the tunnel on the south side. It was about 12 feet thick on the right side of the core. On the north side of the core, it was 4 feet thick or thereabouts. On the north side of the tunnel, it was from 1 to 2 inches, —the north side of the tunnel. [1714] It varied greatly throughout; it was extremely irregular.

(Testimony of Ben M. Page.)

Mr. Smith: Q. Did it traverse the tunnel at right angles to the center line?

A. No; it did not. It traversed the tunnel obliquely——

The Court: Q. That is indicated there on the model? A. Yes, sir.

Mr. Smith: Q. And it was at its widest width at the point on the north side of the south drift?

A. It was. It became narrower again where it intersected the roof of the tunnel.

Mr. Smith: That is all.

The Court: We will take a recess.

(Recess)

The Court: Proceed, gentlemen.

Cross Examination

Mr. Tinning: Q. Mr. Page, you said that your employment for Six Companies commenced, I think it was, on September 23, 1935, within a month after this slide of August 28th; and it extended to September 24, 1936; that was several months after the work stopped there when the Six Companies left the job? A. Yes.

Q. Were all of your observations over the portions of the tunnel which were not excavated, not fully excavated, by Six Companies, made in the drifts; or did you go back there after September 24, 1936, when the other contractor was finishing driving the tunnels?

A. They were all made in the drifts. That is indicated on the description on the model.

(Testimony of Ben M. Page.)

Q. Then, where you traced lines and faults or other formations that may have been, or that are, indicated on this diagram, they are simply approximations of locations taken from what you could observe in the two wall plate drifts?

A. Yes, that's right. I would like [1715] to add that the legend makes that clear, because there are certain conventions regarding the contacts and the faults that show whether I saw those types of contacts or whether they are inferred.

Q. Well, I thought I understood that; that is why I was asking you the question. Would you mind stepping down and looking now at Plaintiff's Exhibit No. 100. At Station 131 plus 00, we have two lines that are roughly parallel, and the one which I first see on the model—it seems to be a dotted line; and I see it was extended at least across the top of the tunnel, —the crown of the tunnel?

A. Yes, that's right.

Q. The line immediately next to it is a fault shown in detail?

A. That is correct.

Q. Was the tunnel constructed to 131 plus 00 at the time that Six Companies stopped?

A. Yes, it was.

Q. On the south tunnel?

A. That's right.

Q. Now, these faults that you show on the crown of the tunnel, under the legend, "Positions Inferred"—Have I read that correctly?

A. Yes.

Q. I am now referring to the fault shown at the crown of the tunnel between 135 plus 00 and 136

(Testimony of Ben M. Page.)

plus 00. How were you able to locate that fault at the top of the tunnel?

A. I saw a fault at several places, and projected it in between, —which is a very conventional geology practice.

Q. Was this portion of the tunnel shown at 136, or between 135 and 136, excavated, by Six Companies?

A. The arch was. The walls were not entirely. About half of that area was entirely excavated by the Six Companies.

Q. So you projected it from the reports and the information that was available there?

A. Yes.

Q. Now, to go further toward the east, between Stations 138 and 139, [1716] you have a fault shown in dotted line, which apparently has a solid line at the point where it passes the drift?

A. Yes. That was my intention. It shows I saw it in the drift.

Q. How did you see these gravel glands that are shown in the portions of the tunnels that were not excavated by Six Companies?

A. I saw those in the drifts also.

Q. Are those approximations through the rest of the area?

A. Yes. I merely saw them in the drift; and that is so indicated on this description.

Q. Let's look, for a moment, at the fault or dike between 126 and 127, which is the fault that was in-

(Testimony of Ben M. Page.)

volved in the slide of February 22, 1936: You were able to take careful measurements of that, —the location of those lines as you have shown them here; and that is generally a representation of the exact position of that fault?

A. Yes, it is.

Mr. Smith: Do you mean "fault"? You mean "dike"?

Mr. Tinning: It says "fault" on the side.

The Witness: Assuming certain lines, the dike and associated fault.

Mr. Tinning: Yes.

A. That is correct.

Q. When you commenced to gather the data, from which this model is made, in September of 1935, when did you first report your findings to anyone in the Six Companies' employ?

A. I have no idea. From time to time, I made casual remarks about what I had seen. I don't remember when I gave any formal report.

Q. Well, Mr. Page, to whom did you communicate your casual information?

A. Many people, including Mr. Tom Price and Professor Tolman at Stanford University.

Q. Professor Tolman was employed by Six Companies as consulting geologist prior to your going on the work on September 24, 1935?

A. That is my understanding. [1717]

Q. You were selected by him when you reported to Six Companies?

A. Yes.

(Testimony of Ben M. Page.)

Q. To make these tests. Whom, besides Mr. Price, did you communicate what you found there in your geological examination?

A. From time to time, I talked with Mr. Peterson about the observations I had made.

Q. Mr. Otto Peterson?

A. I don't know Mr. Peterson's first name.

Q. The gentleman who is here in court?

A. That is right.

Q. And he was also employed by Six Companies at that time?

A. I believe he was.

Q. And in making your report to him, you were making it to a man who was working for the Six Companies on their problem, were you not?

A. Yes.

Q. Your geology work,—the method of survey and the records that you kept,—were matters on which you received directions from Professor Tolman?

A. May I have that question?

(Pending question read)

A. Yes, sir; that is correct.

Q. When did you make your first written report on this survey which you made?

A. As I recall, my report was not formally handed in to Six Companies until the fall of 1937.

Q. When did you make it?

A. I had written a report from time to time throughout the work. I redrafted it at least once or twice.

(Testimony of Ben M. Page.)

Q. Then you did not give any written report to Six Companies or to Professor Tolman until some time in the fall of 1937?

A. That is my recollection, yes.

Q. Have you ever made an examination of the geological formation in other—in any other tunnel in the Bay region?

A. No, sir; I have not.

[1718]

Q. When did you graduate, Mr. Page?

A. 1933, in June.

Q. This is the only tunnel geological report that you ever made?

A. Yes, sir.

Q. Were you familiar with the geological conditions encountered in the Claremont Tunnel?

A. Not at the time of my employment.

Q. Have you studied them since you were employed?

A. Only in a casual way,—an indirect way. I was not in the tunnel; I did not see the ground for myself.

Q. Have you read documents or publications that recite the geology formations encountered in that tunnel?

A. I read portions of the geological report on that tunnel.

Q. As compared with the Broadway Tunnel, do you know whether or not the quantity of water encountered in the Claremont Tunnel was larger or smaller?

(Testimony of Ben M. Page.)

A. I am fairly sure that it was larger in the Claremont Tunnel.

Q. You have stated that there were certain wet areas encountered in the orindan formation in the Broadway Tunnel. Do you know how the water or wet areas in the Claremont Tunnel compared with those in the Broadway Tunnels?

A. No; I do not.

Q. Isn't it a fact, Mr. Page, that the formations that were encountered in the Claremont Tunnel were a similar type of formation,—the so-called Monterey and cherts and Orindan—were generally similar to those encountered in the Broadway Tunnel?

A. The Claremont Tunnel went through the cherts and shale and through the Orindan. It also went through other formations that were not involved.

Q. Yes. Well, I am only referring now—

A. Yes.

Q. —to those that were comparable.

A. Yes, that is correct.

Q. And it is true, is it not, that in the Claremont Tunnel there was very much more water encountered than in the Broadway Tunnel? [1719]

A. That is my general impression.

Q. That would make the conditions more difficult in the Claremont Tunnel than they were in the Broadway Tunnel, would it not?

A. Not necessarily.

(Testimony of Ben M. Page.)

Q. Do you think that there would be any condition in which water,—larger quantities of water,—would not have increased the difficulties in tunnels in comparable formations?

A. Yes, I do, to a certain extent. I will have to qualify my answer.

Q. What do you mean?

A. That I think even within the same formation different portions of it behave differently in regard to water, and that in one situation a slight amount of water is just as bad as a great volume of water in another situation.

Q. Well, it would be highly desirable, from a standpoint of tunnel driving, to find a formation where there was no moisture,—no water,—wouldn't it?

A. Not necessarily.

Q. It would not. How about the Orindan?

A. In the Orindan, that holds perfectly true.

Q. In granite, it would not make much difference, would it?

A. Well, granite varies like any rock; just the mere name "granite" does not necessarily mean that it is a strong material.

Q. Well, apparently I am not quite technical enough for you, Mr. Page. You talk about some hard rock that did not require any support?

A. Well, I can think of situations where water would not make much difference.

Q. That was what you meant when you said it did not make much difference in the case of the Claremont Tunnel or this tunnel?

(Testimony of Ben M. Page.)

A. That was part of my intention. May I add that there are other cases where a certain degree of moisture is an advantage?

Q. Is it ever an advantage in the Orindan?

A. Not to my knowledge; I think not. [1720]

Q. And it is characteristic of Orindan, when there is a presence of moisture, that you have a weakness of the structure? A. Yes.

Q. That was true in the Claremont Tunnel and it was true in the Broadway Tunnel?

A. It was true in the Broadway Tunnel. I do not know about the Claremont.

Q. Is there any advantage in finding water in the cherts?

A. There is, under some situations; but by "water" in this case I refer to "moisture." Where the cherts are fractured in a certain manner, the presence of a slight bit of moisture causes more cohesion than the fragments would have if they were dry. That just applies to certain situations, not for any part of the cherts.

Q. Mr. Page, in the case of the Broadway Tunnels, do you know, while you were there, what the largest quantity of water per minute was that was produced in, say, the north tunnel in the cherts?

A. No; I don't. I do recall that, in the south tunnel, one of the District men, whose name slips my mind, mentioned that he had measured a flow of 120 gallons a minute in the south tunnel.

Q. How long did it last?

(Testimony of Ben M. Page.)

A. I have no idea; that is, on any certain determination; but I think it did not last more than a few weeks at the most, and then it dwindled.

Q. In other words, it was water when the tunnel was driven through one of these areas of broken cherts, was it not?

A. No; it came out of one of the best portions of the cherts.

Q. Came out of solid cherts?

A. It came out of a fault which is indicated on this exhibit.

Q. Was the fault in broken—

A. No. The fault was between the bedding planes of the cherts and the cherts itself was in better condition than most of that formation was.

Q. This was one of those faults where there had been movement without a grinding up or pulverization?

A. Yes. [1721]

Q. And at that place there was this considerable flow of water which your memory now indicates may have run for several weeks?

A. Yes.

Q. Was there sufficient water flowing out of that fault to cause the floor of the tunnel to have water flowing over the entire floor of the tunnel?

A. I don't recall. I do recall that, for the most part, within, say, a week or two after that flow was encountered, all the water was kept in the drainage ditches.

Q. Did you see the tunnel immediately following the time that water was encountered?

(Testimony of Ben M. Page.)

A. Yes, I did.

Q. Did you see it when it was flowing over the floor of the tunnel at any time?

A. Yes; but I cannot remember the depth.

Q. How large an area was it flowing over on the floor; what was the spread?

A. As I recall it, 6 or 8 feet wide; and my recollection is that for a time that floor was covered by water to a slight depth; it was not deep. [1722]

Q. What do you mean by a slight depth, an inch, or two inches, or a foot, or two feet?

A. The water, as I recall it, did not go over the tops of the rails.

Q. How deep would that be?

A. Less than a foot.

Q. Considerably less than a foot? A. Yes.

Q. About three or four inches?

A. Yes, something in that order of magnitude, perhaps six inches.

Q. Now, you mentioned at considerable length sections in the Orinda in which there was wetness at various places, and you have indicated on the diagram what they were. What would be the flow of water, the largest amount of water that was coming out of any of these areas that you have described in the Orinda?

A. I don't know. It was collected in sumps and pumped out. The engineers could probably tell you but I could not.

(Testimony of Ben M. Page.)

Q. Are you referring now to the east portal of the tunnel?

A. Yes, the drift driven from the east portal.

Q. Did you ever see any slides in the east portal of the tunnel?

A. I saw a small slide in the north drift of the north tunnel.

Q. That was on February 11, 1936?

A. Yes.

Q. At that time the north tunnel had been excavated from the east portal toward the west a distance of some 40 or 50 feet, had it not?

A. Does your question apply to the drift or to the completed tunnel?

Q. To the tunnel.

A. As I recall, the core was still in place; the rings had been taken out for 40 or 50 feet.

Q. And the concrete put in? A. Yes.

Q. And there was a slide on that face, was there not, on that same day, the slide that you have described on your model?

A. A slide on the face?

Q. On the face of the core?

A. I don't know about that.

Q. Didn't you see that?

A. No, I did not. [1723]

Q. Were you only observing in the drift?

A. I spent a large part of the time during that period on the west side, because that is where the excavation was in progress. I did most of my

(Testimony of Ben M. Page.)

study in the east portal, when the excavation was suspended.

Q. On the date that you have indicated the slide in the wall plate drift of the north tunnel, on February 11, 1936, did you observe the condition at the east portal in the north tunnel?

A. I suppose I did, but I can't remember what I saw.

Q. Isn't it a fact that the slide that you saw was a part of the slide that occurred when the pumps broke down at the east portal and when the face of the tunnel, in the north tunnel, was submerged with water to a depth of 10 to 12 feet by rainstorm?

A. I don't remember that. I do remember the rainstorm, and that there was a general wet condition in the drift, but I don't remember the condition of the core.

Q. Was the wall plate drift where you have described this slide occurred entirely closed by the slide?

A. Yes, it was for a distance of perhaps thirteen feet.

Q. Could you see both sides of the slide, both the east and west sides?

A. No, I did not. I merely took the measurement of the concrete for the east limit of that slide. I do not recall ever going around the east side of the slide.

Q. How did you fix the location of the east side of the slide, then?

(Testimony of Ben M. Page.)

A. By the fact that none of that concrete had caved in, according to some of the engineers.

Q. Somebody else told you it had not caved in, so you took that as the location? A. Yes.

Q. Now, these dikes that you have referred to, I think you said the sandstone was a sedimentary rock and that it was not usual to call the sandstone intrusion a dike, but for the purpose of clarity [1724] you were using that term in this tunnel?

A. I think it is usual to call them dikes when they occur in these situations.

Q. What do you mean by "these situations"?

A. Where the material cross cuts the surrounding rock instead of being interbedded.

Q. In other words, a dike, if I understand you, then, is something that is interjected into other material? A. Yes.

Q. Cutting into and separating it?

A. Yes.

Q. If the sandstone laid free in the natural strata of other material it was something laid down by nature and not by intrusion?

A. Yes, in generality that would be true; it is conceivable that it might be intruded between layers but that would be difficult to ascertain.

Q. What causes sandstone to intrude between layers of other material as it did in this Broadway tunnel in the formations you saw in the Broadway tunnel?

(Testimony of Ben M. Page.)

A. That is an unanswered question, no one knows; I should not say it is entirely unanswered, because there have been some theories, but they are not generally accepted by all geologists.

Q. You have given us some theories here on a number of matters. Would you mind giving us your theory about a sandstone intrusion into other material?

A. Yes, I would object to giving a theory on it. The fact is that I hesitate to try to explain their presence.

Q. You would not have the theory that the District put them there, would you?

A. No, I would not pull that theory.

Q. I suppose in regard to the diabase dikes you would also agree that the District did not put them there?

Mr. Smith: I object to the question as silly and argumentative.

Mr. Tinning: Q. Your answer would likewise be the District did not put the sandstone there, or the diabase there? A. Yes.

Q. How about the diabase dikes, what explanation can you give for those?

A. There is a generally accepted explanation for the [1725] diabase. The material arrived in a molten condition which filled the cracks or fissures, in many cases apparently widening the cracks or the fissures.

(Testimony of Ben M. Page.)

Q. In other words, it came in under pressure while molten? A. Yes.

Q. And expanded and then cooled in that location? A. Yes.

Q. Where does that molten material come from?

A. Nobody has ever seen the material in its native haunts, so to speak. The material, it is believed, comes from local areas of melting at depths, and only at depths in the outer part of the earth; in other words, I do not mean that they come from the center of the earth.

Q. It is like a volcano, is it not?

A. Not necessarily. If the material ever reached the surface a volcano might result.

Q. You find similar material reaching the surface through volcanic formation, do you not?

A. To a certain extent you do, yes, although I have never seen the alteration that I have described in the case of any surface lava flows.

Q. Mr. Page, the alteration is something that occurred after the material arrived and was put into place where it came to rest? A. Yes.

Q. Now, we are talking about how it got there and not what happened to it afterward. What I am trying to get clear in my mind is where it came from. It came from hot rock which was pushed up there by pressure from below? A. Yes.

Q. You also find a like condition in a volcano, do you not? A. Yes.

Q. Now, this rock not reaching the surface was

(Testimony of Ben M. Page.)

acted upon by something. Do you know what it was that acted upon it, water, or what?

A. No, I do not think so. I know that the reagent was some sort of a chemical solution.

Q. That would be something that was carried there with the water?

A. If that is so I assume that would be correct.

Q. You did not see any other liquid in these rocks except water, [1726] did you, when you were looking at them?

A. Not in the diabase.

Q. So it would be a fair assumption that whatever it was that caused their alteration it was carried to those rocks by water? A. Yes.

Q. And over the years, whatever they were that were carried into contact with this intrusion of diabase, were the chemical constituents of the diabase altered, or was the physical formation altered by it?

A. The chemical constituents which, of course, involved a lot of physical properties.

Q. I think you told Mr. Smith earlier when you first saw it you had some doubt of what it was, you thought it was a gouge?

A. That is true.

Q. I presume you put it under a microscope and studied it to see what that material actually was?

A. Yes, I realized that if it was a gouge it was very peculiar gouge, because it occurred in such irregular bodies.

(Testimony of Ben M. Page.)

Q. Did you make a chemical analysis of this material?

A. No, I did not. I made a petrographic study under the microscope.

Q. You determined what the constituent parts of this material were by visual inspection through a microscope?

A. To a large degree I did determine.

Q. You did not determine it in any other way except by a visual inspection through a microscope?

A. Only in this sense, that I tested the material with acid to see if it contained carbonates.

Q. Did it? A. Yes.

Q. Is that a characteristic of diabase?

A. It is not.

Q. What is a diabase?

A. A diabase loosely defined is an igneous rock with a characteristic texture.

Q. What are the chemical constituents of a diabase?

A. A diabase consists largely of various silicates, silicates of sodium, calcium, [1727] aluminum, iron, magnesium, various other chemical elements.

Q. Was this material that you saw acted upon by something that changed the chemical formation?

A. Yes, and it changed the chemical constituents.

Q. And gave it some carbonate qualities?

(Testimony of Ben M. Page.)

A. Yes.

Q. What, in your judgment, would bring the carbonate components to that chemical mixture that you speak of?

A. In my judgment it came from a rising solution, it came up from the earth.

Q. What were the things then that bore the carbonates into the diabase? Coal is a carbonate, is it, not?

A. No, it is not.

Q. What is?

A. What is coal?

Q. No, what is a carbonate?

A. Carbonate is a chemical compound which contains a certain radical expressed by CO_3 and certain chemicals.

Q. What was it that formed the CO_3 in this mixture that you found?

A. That, again, takes us into the realm of theory; undoubtedly the solution that— I should not have said “undoubtedly,” but probably the solution that performed that result contained carbon dioxide or some other reagent that could convert the minerals into carbonates.

Q. What is the common name that laymen, like most of us here, would know—what name would you give to those things that would bring that carbonate deposit?

A. I do not know of anything that would not be technical.

(Testimony of Ben M. Page.)

Q. We will pass that. Now, your diabase dikes are intrusions, and your sandstone dikes are intrusions. Do you know whether those formations were characteristic of the hills that lay on the east side of San Francisco Bay through which other tunnels have been driven? A. No, I do not.

Q. Then when you say heavy material, that the ground required support, [1728] you are referring particularly to this ground that you saw there in these tunnels? A. Absolutely.

Q. You have no knowledge, whatsoever, of what conditions were encountered in the driving of other tunnels in the general area of the Broadway Low Level tunnels?

A. Yes, in a general way I have.

Q. How, if at all, did the material through which the Broadway Tunnel was driven differ in general from those through which other tunnels were driven?

A. Since I was not in the other tunnels I can only rely upon reports about them, but those reports make no mention of altered diabase; they make no mention of sandstone dikes.

Q. Do you, from that, draw the conclusion that this tunnel was the only tunnel in which those formations were encountered?

A. I did not draw any conclusion regarding that.

Q. You don't know, do you?

A. No, I don't know.

(Testimony of Ben M. Page.)

Q. And if it was a fact that in the Claremont Tunnel, in driving through the Orinda formation they found pieces of cherts, pieces of sandstone, sort of isolated in the formation, you would find a condition that would be the same as you had in portions of the Broadway Tunnel, would you not?

A. That does not exactly portray the conditions in either place, from what I heard of the Claremont Tunnel, and what I know of the Broadway Tunnel.

Q. I have tried to follow you, and I understood you to testify that in the Orinda at places you found isolated bulges of other material. I am not talking now about what you call Dikes, but I am talking about pieces of sandstone and pieces of cherts that you said apparently had been moved into the Orinda when it was laid down.

A. No, you misunderstood me. I referred to another sandstone formation, the sandstone that is indicated in blue on this exhibit No. 100. [1729]

Q. Where were these isolated globules or particles of material found isolated in other material, in what part of the tunnel?

A. A great deal of the sandstone that occurred within the westernmost half of the Broadway Tunnel, that sandstone was contained here and there with various fragments of cherts and shale, which were isolated entirely and surrounded by the sandstone.

(Testimony of Ben M. Page.)

Q. In your opinion were those pieces of foreign material laid down in the sandstone when the sandstone was laid down by the water that formed it?

A. Not in my opinion.

Q. How did it get there, in your opinion?

A. In my opinion they got there during the emplacement of the sandstone, whatever that emplacement was.

Q. What do you mean by that?

A. I mean that the sandstone occupies an abnormal position in relation to the surrounding rock, and that instead of being deposited in layers between the beds of cherts and shale with sandstone, it reached its present situation in some other way.

Q. You mean pressed up there by some internal force?

A. That would be one theory.

Q. What other way could it get there?

A. It might have dropped down from above, but I do not hold that theory.

Q. United Air Lines were not running then. How could it drop down from above?

A. In some situations where sandstone overlies another rock the inconsolidated sand has filtered down into cracks in underlying rocks and there solidified through cementation.

Q. Would pieces of cherts and pieces of this other material isolated in the sandstone be formed in the way you have just referred to?

A. It is very doubtful.

(Testimony of Ben M. Page.)

Q. Then why go into it, if it doesn't happen that way? What, in your opinion, was the reason for these pieces of broken material you [1730] found in the sandstone?

A. I can give you a theory which I considered but I never drew any definite conclusion about these sandstone dikes.

Q. Mr. Page, if you don't know, if you have not any theory that you believe is correct, I do not want to go into it. Have you an explanation that you think is a correct explanation of that condition?

A. I have an explanation but there are defects in it.

Q. Then we will go on to something else. Now, the faults which you referred to, as I understand it, are planes in which there has been movement of some kind?

A. Yes.

Q. And sometimes these faults are formed in such a way that there is broken material at the point of contact, I think you used the words "rock flour"?

A. Yes.

Q. That is a form of gouge?

A. Yes.

Q. When you find fractures such as you have shown in this tunnel formation you have always had a movement at the point where the fractures occurred, have you not?

A. Yes, at least, if you are referring to fault.

Q. I am referring to what you said here were faults.

A. Yes, that is correct.

Q. That you have shown?

A. Yes.

(Testimony of Ben M. Page.)

Q. So that those indicate wherever they are to be found in this model, that in the hills at the point where those were encountered there had been movement in the material? A. Yes.

Q. And it is likewise true throughout the San Francisco Bay region that you find broken sections of material throughout those hills, is it not?

A. In many places in the hills that is true.

Q. And it is characteristic of those hills on the east side of San Francisco Bay, that you find this broken, fractured material?

A. I don't know that it is characteristic as to all of them, because [1731] I have not visited every part of the hills on the east side of the Bay.

Q. You have heard of the Wildcat Fault, the Pinole Fault, and San Andreas Fault, and Hayward Fault, haven't you? A. Yes.

Q. Those, with the possible exception of the San Andreas Fault, are all in the student books about the East side of San Francisco Bay, the very hills through which this tunnel passes?

A. They may be in some of the student books, some of the faults you have mentioned are well known and others are not.

Q. You do not mean that Professor Tolman hasn't them in his book?

A. That he has them?

Q. Hasn't them in his book?

A. I have never seen any of Professor Tolman's books.

(Testimony of Ben M. Page.)

Q. You do know, as an expert geologist, that there are a number of faults in the area in which these tunnels are built, and that the tunnel, itself, passes through a well-known fault on the geological map published by the United States, known as the Wildcat Fault?

A. Yes, they go through that, at least one is designated as the Wildcat Fault on the map you refer to.

Q. You know what that fault is, don't you?

A. I do not.

Q. Don't you believe in the United States Geological map?

A. I have no reason to believe it or to not believe it, but geologists are usually skeptical.

Mr. Tinning: That is all.

Mr. Marrin: No further questions.

The Court: We will take an adjournment now until tomorrow morning at ten o'clock.

(An adjournment was here taken until tomorrow, Wednesday, May 25, 1938, at ten o'clock a.m.)

[1732]

Wednesday, May 25, 1938;

10:00 o'Clock A. M.

THOMAS L. PHILLIPS,

called by the plaintiff; sworn.

Direct Examination

Mr. Smith: Q. Where do you reside, Mr. Phillips? A. 983 Park Lane, Oakland.

Q. What is your business or occupation or profession, Mr. Phillips?

A. I am a civil engineer, employed by the Western Pacific Railroad Company. My title with the Railroad Company is Principal Assistant Engineer.

Q. Are the duties of that position similar to Chief Assistant?

A. It is in fact Assistant Chief Engineer.

The Court: That means that the assistant does the work, I suppose? A. Yes.

Mr. Smith: Q. Mr. Phillips, will you state, for the benefit of the Court, your experience as an engineer, commencing with the first engineering work that you had anything to do with; state it in general?

A. My first work in the engineering profession, I might say, was in the beginning or early part of 1902. I was employed on an engineering party that was running a survey up the Klamath River, and I started in as an ax man and finished up as instrument man on that job, in November of the same year.

(Testimony of Thomas L. Phillips.)

Q. What followed?

A. The following winter I was on a survey from Livermore through Dublin Canyon to the waterfront in Oakland; that work was supposedly for the advance surveys of the Western Pacific.

Q. That was at the time of the construction of the original Western Pacific Railroad?

A. That was considerably in advance of that time.

Q. In advance of that. Proceed.

A. The following spring,— [1733] the spring of 1903,—I was on surveys in Mendocino, Sonoma and Humboldt Counties, California, for the Atchison Topeka & Santa Fe. I was instrument man on that work. During the next two years, I was on various work, including the construction of a section of the Albion Lumber Company's Railroad and the extension of the McCloud River Railroad Company, which is a part of the McCloud River Company.

Q. Where was the Albion Lumber work situated?

A. In Mendocino County.

Q. Where was the McCloud work?

A. In Siskiyou County, California.

Q. In what year was that?

A. That was in 1904.

Q. What next occurred in your experience?

A. In the early part of 1905, I was employed as engineer for the Eel River Power and Irrigation

(Testimony of Thomas L. Phillips.)

Company. They had a project in Mendocino County some 25 miles northeast of Ukiah. This project comprised quite an extensive dam across the main South Eel River and a tunnel through a section of the Coast Range Mountains into Potter Valley.

Q. What type and size of tunnel was that?

A. The tunnel was about 9 by 9; approximately 5800 feet in length.

Q. Was that your first experience on tunnel construction?

A. Yes, it was.

Q. What year was that?

A. That was in 1905.

Q. What were your duties?

A. My duty was engineer of surveys, primarily to lay out the work. I did not do any of the designing work. I did a great deal of inspection, however.

Q. After that employment and work, what was your next assignment or duty?

A. That work closed down, or nearly closed down, in November; and I, at that time, got employment with the Western Pacific Railroad Company.

Q. In what capacity?

A. As instrument man.

Q. Where and what were your duties?

A. The section of work it [1734] was on was between Livermore and Hayward, California; and my duties were that of instrument man.

(Testimony of Thomas L. Phillips.)

Q. What were they doing,—surveying or constructing,—at that time?

A. Both surveying and constructing, largely constructing. It was building the section of the Western Pacific between Livermore and Hayward.

Q. Was any tunnel work involved in that work?

A. Yes; there were two railroad tunnels and a water tunnel for the Spring Valley Water Company in Niles Canyon, Alameda County.

Q. Will you describe the character of the tunnels, as to their size and length,—the general nature?

A. The railroad tunnels,—one of which was approximately 4300 feet in length; and the other, approximately 400 feet in length,—they were standard tunnels, the excavation for which was approximately 21 feet wide by 25 feet high. The water tunnel was nearly 900 feet in length, and the excavation for that was about 9 feet by 9 feet.

Q. What was the approximate location of those tunnels; were they in Alameda County?

A. Yes, they were in Alameda County, some 3 or 4 miles northeast of Niles.

Q. How long were you engaged working at those tunnels, or for that railroad on which those tunnels were located?

A. I was there about two years and a half.

Q. What duties did you have, if any, in connection with the tunnels?

(Testimony of Thomas L. Phillips.)

A. My duties were to see that the work was done according to the established lines and grades and plans and specifications, and to make inspections and make recommendations as to how much timbering and the spacing it should be placed in the tunnels.

Q. Were they timbered tunnels?

A. Yes, they were.

Q. Throughout?

A. Not throughout. One of the portals was concreted; and there was a section of concrete installed under the [1735] point where the Spring Valley Water tunnel passed over.

Q. Which tunnel was that?

A. That was in the longest tunnel, known as Tunnel No. 1,—Western Pacific Tunnel No. 1.

Q. That is on the mainline of the Western Pacific now?

A. That's right.

Q. That is its present number on the main line?

A. That's right.

Q. Outside of the sections of that tunnel that you say were concrete, was the entire balance timbered or not timbered?

A. It was all timbered except the section concreted.

Q. What specific duties did you have inside the tunnel, if any, in the discharge of the general duties that you just described; what did you actually do, yourself?

(Testimony of Thomas L. Phillips.)

A. I actually ran the line and grade to establish the points for the contractor to set the linings, whether they were timber linings or concrete linings.

Q. Were those tunnels built by company forces of the owner or by private contract with outside parties?

Mr. Wittschen: Objected to as immaterial. I think, under the guise of qualifying the witness, counsel is about to go into the situation of how they ran their lines and grades in those tunnels.

Mr. Smith: No; that was not the purpose at all. I was just going to show his duties.

Mr. Wittschen: It is immaterial, in any event.

Mr. Smith: It is not immaterial at all. I want to show the experience of the witness in handling work: whether he handled construction work for the owner entirely or—

The Court: Read the question.

(Pending question read.)

The Court: Proceed. [1736]

Mr. Wittschen: Note an exception.

The Witness: A. They were largely built by contractor. However, I should say approximately one-half of the longest tunnel, or Tunnel No. 1, was finished by company forces.

Mr. Smith: Q. After you finished working, or when you finished what you were doing there, what did you next do; what were your next duties?

(Testimony of Thomas L. Phillips.)

A. I was promoted to assistant engineer and transferred to San Francisco, where I completed the freight terminal of the Western Pacific in this city.

Q. What was the general nature of that work?

A. The work comprised a wharf, railroad yards, freight terminal and a tunnel 1625 feet in length.

Q. Where is that tunnel located?

A. It is in the Potrero Hills, San Francisco.

Q. Approximately what streets?

A. About 22nd and Mississippi on one end, and 18th and Mariposa, I believe, on the other; it runs diagonally through the city blocks.

Q. Is that a timbered tunnel?

A. Yes, it is timbered throughout.

Q. Is that tunnel approximately the same size as the mainline tunnels?

A. It is; the standard mainline tunnel construction.

Q. It is designed and built for the passage of railroad trains?

A. Yes.

Q. What were your duties on the construction of the terminal, including the tunnel, in general, as assistant engineer in charge?

A. To supervise the work, make inspections and see that it was carried out in accordance with the plans and specifications.

Q. In particular, with regard to the tunnel, what were your duties? Were they the same as you have just mentioned?

A. Yes.

(Testimony of Thomas L. Phillips.)

Q. Was that tunnel built by company forces or by private contract? [1737]

A. It was built by contract let to the Western States Construction Company.

Q. You were acting for the owner of the tunnel?

A. That's right.

Q. During what years and for how long a time did that employment run; what was the date?

A. I started there in 1908, and construction work was finished in the latter part of 1909.

Q. After you had finished your duties in the construction of this terminal, including that tunnel, what did you next do, Mr. Phillips?

A. The Western Pacific started operations, and my duties were spread over the Western Division of the Western Pacific, and covered many things.

Q. What is the geographical extent of the Western Division?

A. From San Francisco to Gerlach, Nevada, including various branch lines.

Q. Were there any tunnels, aside from the tunnels you have mentioned, in Alameda County and in San Francisco, in that division?

A. Yes. All told, there are, as I now recall, 36 tunnels.

Q. What were your general duties as division engineer, particularly in connection with the tunnels?

A. I made frequent inspections of tunnels in regard to the position of the lining of the tunnel

(Testimony of Thomas L. Phillips.)

to the center line of the track, to insure that there was sufficient clearance for safety for the passage of trains, and also had a great deal to do with the company forces, or company gangs, that were doing any necessary repair work in these tunnels.

Q. Generally in charge of maintenance of these tunnels then; is that correct?

A. Yes, I had a great deal to do with the maintenance of the tunnels.

Q. How long did your duties consist of the character you just described?

A. Along the lines that I have just described, until about the beginning of 1916.

Q. Approximately 8 years?

A. 7 or 8 years.

Q. What did you next do? [1738]

A. Beginning with the spring of 1916 I was engineer in charge of concrete lining for the Western Pacific tunnel in Plumas County known as Spring Garden Tunnel. Part of this tunnel had previously been concrete lined, but it was desired to complete the job, so we spread the work over a period of three years, and I was in charge during those three years, and in that time concrete-lined 6600 feet of the tunnel.

Q. That was a standard railroad tunnel?

A. Yes.

Q. And had previously been timbered?

A. That is right.

The Court: Q. Was it timbered in its entirety?

(Testimony of Thomas L. Phillips.)

A. It was originally, yes.

Mr. Smith: Q. What was the total length of that tunnel?

A. The total length is 7335 feet.

Q. During that same period that you were doing that lining job on the Spring Garden Tunnel were you in charge of the other work?

A. Yes, in the early part of 1917 I located and started the construction of a branch line from the easterly end of the Western Pacific, Chilcoot Tunnel, to Reno, Nevada. This line is 32 miles long.

Q. That work, as I understand you, you did while you were also doing this work at the Spring Garden Tunnel? A. Yes, that is correct.

Q. Following that period, which lasted two or three years, what did you next do and where, and how long a period?

A. In 1918 I was appointed Division Engineer of the Western Division of the Western Pacific. The line, as I described, was between San Francisco and Gerlack, Nevada. A division engineer's duties are having full charge of the maintenance of way for the railroad company over their respective divisions, and referring particularly to tunnels it was my duty to see that all of the tunnels under my jurisdiction were in [1739] proper shape and in safe condition for the passage of trains.

Q. That division is the same as you mentioned previously, from San Francisco to Gerlack?

A. That is correct.

(Testimony of Thomas L. Phillips.)

Q. How long did your duties continue as you have just described when you resumed them in 1919?

A. I was in that position for two years, until July, 1920.

Q. Then what did you do?

A. I located and constructed a line up the middle fork and south fork of the Feather River for the Hutchinson Lumber Company.

Q. You say you located and constructed a line. What do you mean, a line of railroad?

A. A line of railroad, standard gauge railroad.

Q. You were not then employed by the Western Pacific, you had left that employment?

A. I was on leave of absence for a short time and later in that year went back in the employment of the Western Pacific and constructed a portion of this line which is now owned by the railroad company, the Western Pacific Railroad Company.

Q. Where was that line located, in what county?

A. In Butte County.

Q. Any tunnels in it? A. No tunnels.

Q. As I understand it, it connects with the Western Pacific and is now part of the Western Pacific?

A. Part of it is part of the Western Pacific and the other part is still in the ownership of the lumber company.

Q. But the whole line is connected? A. Yes.

Q. After you went back to the Western Pacific what was your next title and duties and for how long?

(Testimony of Thomas L. Phillips.)

A. My title when I went back with the Western Pacific in 1921 was Assistant Engineer, but my duties and position were somewhat extended. I covered the entire system.

Q. Where did the system run from?

A. From San Francisco to Salt [1740] Lake City, including the various branch lines.

Q. What was the general nature of your duties?

A. General engineering work covering any subject I might choose to take up, as well as such other duties as the Chief Engineer might delegate to me.

Q. For how long a period did you discharge this particular office?

A. Until June, 1927.

Q. That is a period of approximately six or seven years?

A. Yes.

Q. Did you have charge of any construction work during that time?

A. Well, I had charge of all of the construction work the company had during that period. I do not recall just now of anything of major importance. I did, however, perform the same duties as I had theretofore in regard to the inspection of various structures, including bridges, tunnels, or any other features.

Q. But you did not construct any tunnels during that period?

A. No, I did not construct any tunnels.

Q. You said 1927 was the end of that particular time. What happened then, and what have you done since?

(Testimony of Thomas L. Phillips.)

A. The reason I mentioned June 1927 was I was promoted at that time to Principal Assistant Engineer.

Q. The same office you now hold?

A. The same office I now hold.

Q. During that period, since June, 1927, have you had charge of any construction work?

A. Yes.

Q. Including any tunnels? A. Yes.

Q. Just state to the Court what that work was, what you had to do with it.

A. In the early part of 1929 I started the location of a railroad between Keddie, in the Feather River Canon, to Bieber, a distance of 112 miles.

Q. Where is Bieber, is it north, south, east or west of Keddie?

A. Almost due north of Keddie. Keddie is in Plumas County and Bieber is in Lassen County, California. [1741]

The Court: Is that the line through Modoc?

A. No, that is not, that is the Southern Pacific.

Mr. Smith: This line that you mentioned is a line that was supposed to connect with the Great Northern?

A. It does connect with the Great Northern at Bieber.

Q. It was constructed for that purpose?

A. Yes.

Q. How many tunnels are there on that line of railroad? A. Nine tunnels.

(Testimony of Thomas L. Phillips.)

Q. What is the approximate length of the nine tunnels, taken together? A. About 3500 feet.

Q. What kind of tunnels are they, in general?

A. They are standard railroad tunnels. However, on this line we built the tunnels on the curve section a foot wider than is generally built.

Q. That is because of the curve? A. Yes.

Q. Were they hard ground tunnels, or were they soft ground tunnels?

A. They were all soft ground tunnels with the exception of one, which would probably be classified as a hard ground tunnel, because it was in hard lava formation.

Q. With the exception of the one that you mentioned, did the others require timber support or other support, artificial support? A. Yes.

Q. What period of time was embraced in your duties in the construction of that line between Keddie and Bieber?

A. The construction started in August, 1930, and was completed in November, 1931.

Q. Was that work done by an arrangement with private contractors or was it done by company forces?

A. It was done by a contract with the Utah Construction Company and W. A. Bechtel Company.

Q. The same two companies that have been mentioned in this case as part of the Six Companies?

A. Yes. [1742]

Q. After you concluded the construction of that

(Testimony of Thomas L. Phillips.)

line what further construction work did you have to do with, if any?

A. In 1932 I had charge of reinforcing the concrete lining of tunnel No. 32 on the Western Pacific. This tunnel is near Keddie.

Q. How long a tunnel is that?

A. About 500 feet. The reinforcing work, however, covered somewhere in the neighborhood of 200 feet of the tunnel.

Q. What other construction work did you have anything to do with during that same period, including the planning of tunnels, or estimating the same, or constructing the same?

A. I have had various construction work, such as extending side tracks, some of which involved heavy work.

Q. Regarding the Dotsero Cut-off, did you have anything to do with that?

A. Well, in 1932 I made a study and report of the Dotsero Cut-off Line.

Q. Where is that line of railroad located?

A. It is located in Colorado.

Q. Are there any tunnels on that line?

A. Yes, there were four or five tunnels.

Q. Did you recommend the way that those tunnels should be lined up and constructed?

A. Yes, I made a report on that line and in regard to the location and the approach to the tunnels, and length of tunnels, and the line was built substantially along my recommendations.

(Testimony of Thomas L. Phillips.)

Q. That, however, was not built by the Western Pacific?

A. No, that was built by the Denver & Rio Grande Railroad Company.

Q. Was there any other construction particularly with reference to tunnels that you had anything to do with since 1932?

A. No out and out construction. I have had a good bit to do with the maintenance of tunnels, and inspection of the various tunnels along the Western Pacific. [1743]

Q. When did you first hear of the Broadway Tunnel? A. August 5, 1935.

Q. What happened then?

A. I went through that tunnel, starting in the afternoon of August 5, and spent the entire balance of the afternoon and the evening going through the entire workings of the tunnel.

Q. Were you employed by the plaintiff in this case at that time?

A. Yes, I was employed by Mr. Bechtel, President of the Six Companies, the contractor on that tunnel.

Q. What duties were given you?

A. I was employed in an advisory capacity to see if I could make any suggestions or recommendations to help the contractors solve some of the problems they had met in this construction work.

Q. Did you consult with any other engineers at that time?

(Testimony of Thomas L. Phillips.)

A. Yes, I consulted with Mr. Tibbitts, particularly, also with Mr. Peterson, and various other ones.

Q. You went over there on August 5, as I understand it.

A. Yes.

Q. What did you observe as to the construction on the first visit? By the way, was that your first visit to the tunnel?

A. That was my first visit to the tunnel.

Q. What did you observe concerning the condition of the construction at that time?

A. I observed that the ground through which the tunnels were being driven was very blocky in places, and had a variable condition; that the tunnels, so far as the workings were open, were timbered, and that the timbering in places was taking a very heavy ground load.

Q. The contractor was engaged in excavating at the time when you first went there, was he?

A. Yes, the excavation was going on.

Q. Did you visit the tunnels in connection with your employment upon occasions after the date you have mentioned?

A. Yes, many times.

Q. How frequently until June, 1936 did you visit the tunnels? [1744]

A. I visited them on an average of about once a week until the end of March. I made one additional visit to the tunnel in the early part of June. As I recall, I made a total of about 37 or 38 visits to the tunnel during the time that I mentioned, between August 5, 1935 and the end of March, 1936.

(Testimony of Thomas L. Phillips.)

Q. Those visits, were they casual, or did you make it a point to go over the entire work?

A. I went there for the purpose of making a full inspection of the tunnel on each visit.

Q. What was your habit, did you go into the headings on those visits?

A. Yes, I went through all the work, as a general rule. There might have been some occasions where I did not see the extreme points, but I went into the drifts and into the top headings and visited the east end of the tunnels on several times; but the west end of the tunnel is the one that I was particularly interested in and at each of these visits I always visited the west end.

Q. Then, as I understand it, you visited the west end every time and the east end most of the time on those visits, is that correct?

A. I would say I visited the west end every time and the east end many times, I don't know just how many times I visited it.

Q. You were in the drift where the men were working?

A. Yes.

Q. Mr. Phillips, speaking of the month of August, 1935, upon how many occasions during that month did you visit the tunnels in addition to your first visit, which you stated was August 5, if you know, just approximately?

A. Five or six times.

Q. Six times in addition?

A. Five or six times.

(Testimony of Thomas L. Phillips.)

Q. How frequently were those visits spaced after August 5, upon what dates, approximately?

A. I could not recall exactly. I remember I was there on the 11th, and I remember I was there on the 28th, the forenoon of the 28th.

Q. That was the forenoon of the day on which later the cave-in [1745] occurred?

A. That is correct.

Q. Were you there in August after the cave-in?

A. Yes, I was there the next day after the cave-in.

Q. What time did you arrive after the cave-in, the next morning, or the same evening?

A. The same evening; I arrived at about 8 or 8:30.

Q. In other words you were twice on the 28th of August, before the cave-in and after the cave-in; is that right?

A. That is correct.

Q. Now, Mr. Phillips, on these visits were you accompanied by others, other engineers, or did you meet with other engineers, including any engineers of the District, or the contractor?

A. Well, very often I went through the tunnels with others. I went through several times with Mr. Tibbetts, I think several times with Mr. Peterson, with Mr. Hindmarsh and Mr. Price and others.

Q. If you observed anything did you communicate the same and make recommendations as an engineer to the contractor?

A. Yes.

Q. During the month of August, 1935, did you

(Testimony of Thomas L. Phillips.)

meet with Mr. Boggs, the engineer for the Joint Highway District, the defendant in this case?

A. Yes.

Q. Upon how many occasions, if more than one?

A. On two occasions.

Q. What were the dates of those meetings, if you remember?

A. On August 16 and August 19, if I recall correctly.

Q. Who was present when you met with him, if anybody else?

A. Mr. Tibbitts and Mr. Barkley.

Q. Who was Mr. Barkley?

A. I understand Mr. Barkley is Mr. Boggs' assistant.

Q. Where were these meetings that you had with Mr. Boggs, were they at the tunnel or elsewhere?

A. At Mr. Boggs' office—

Q. In downtown Oakland?

A. Yes, on Webster street, I think.

Q. What was the sum and substance of the discussion between you and Mr. Boggs? [1746]

Mr. Wittschen: Objected to as immaterial, and calling for hearsay testimony, and conversations which are not binding on the District.

The Court: I will allow it so that he will have a record.

Mr. Wittschen: Note an exception.

A. We discussed the matter of—

Mr. Tinning: Mr. Smith, I think for the purpose

(Testimony of Thomas L. Phillips.)

of clarity, as there were two conversations, that the question should go to one and then the other.

Mr. Smith: That is perfectly proper.

Q. Directing your attention, Mr. Phillips, to the first meeting that you had with Mr. Boggs, as I understand you stated the date of it was approximately what—the 19th of August?

A. The 16th and 19th.

Q. Directing your attention to the 16th of August, 1935, did you see Mr. Boggs on that day?

A. Yes.

Q. Who was present?

A. Mr. Tibbitts and Mr. Barkley.

Q. You and Mr. Boggs, the four of you?

A. Yes.

Q. That was held at Mr. Boggs' office?

A. That is right.

Q. What was the sum and substance of what was said and discussed between you and Mr. Boggs upon that occasion?

Mr. Wittschen: If your Honor please, for the purpose of the record I make the same objection heretofore made on all of the grounds.

The Court: The same ruling.

Mr. Wittschen: Exception.

A. Our discussion that day was in regard to the concrete lining section and the engineering that the contractor was called upon to do in setting lines and grades in the tunnels, that is, the surveying of the lines and grades. We recommended — I say we, Mr. Tibbitts and I recommend to Mr. Boggs that he

(Testimony of Thomas L. Phillips.)

strengthen the con- [1747] crete Section, that is Section A, by adding reinforcing steel and installing a strut at the point over the highway section and under the ventilating chamber, and also installing an invert.

Q. You mean by an invert an additional section at the bottom, underneath?

A. Yes, an additional section across the tunnel at the bottom of the concrete.

Q. Will you proceed and state what was said by Mr. Boggs in respect to this recommendation?

Mr. Wittschen To which we make the same objection, on all of the grounds heretofore stated, and the further ground that this was a gratuitous volunteer offer upon the part of the contractor that we had not called for, and upon which we are not bound, and it was not in the contract; nobody asked him to come in and tell him how much he wanted.

The Court: For the purpose of the record indicate the purpose of this testimony.

Mr. Smith: The purpose of the testimony is to show that the contractor had met problems in the construction which were causing the contractor concern, and he employed outstanding engineers to come in and consult as to the best handling of the problem, and they took the question up with the District and its representative, Mr. Boggs, and as a result of their taking up the matter with Mr. Boggs he immediately began to strengthen and reinforce the concrete lining and put in additional steel.

(Testimony of Thomas L. Phillips.)

The Court: There is no one complaining here about that, is there?

Mr. Smith: Yes, your Honor, it greatly increased the cost, increased the cost and the time.

The Court: All of which is provided for in the contract and specifications? [1748]

Mr. Smith: No, it is not, your Honor, I beg your pardon. The contract does not provide that we are not entitled to an extension of time for doing it. We have a right to show that that took more time, to do that thing, and in addition it will show that the contractor advised the district that the ground condition was of such a character that it was highly dangerous to work in, and that nevertheless the District took the attitude that they would do nothing about it, and let the contractor go ahead and bear the full responsibility for any trouble that might arise.

The Court: The purpose of this offer, you say, is to show the time. Is it limited to that?

Mr. Smith: Yes, to show that it added to the difficulty of the job, so that the contractor could not physically complete the job in the time fixed, and they arbitrarily denied an extension of time.

The Court: I am willing to give you a record on a reason for the time, but we have built this tunnel now three times, and if we build it three times more—

Mr. Smith: I am not trying to prolong this case, at all.

(Testimony of Thomas L. Phillips.)

The Court: The ultimate fact is, though, and it is apparent that we are going along very slowly here; I have allowed you a great deal of latitude here, and I did so so that both sides would have an equal opportunity. The time has come now to check that. There are other cases just as important to try as this case. I have been generous in giving you time. With that admonition we will proceed again, with the hope that we will get to the merits. I am willing to give you a record on any theory that you have in relation to time, but if we are going into the matter of the construction of steel and the details thereof we are just wasting time.

Mr. Smith: There is no desire to go into detail, at all. [1749] It is purely preliminary, and the testimony will not take more than five minutes.

Mr. Wittschen: We will take an exception to the ruling. [1750]

The Court: I told you before the only thing you would have to comfort you is the record; so both sides are entitled to that. Proceed.

Mr. Smith: Q. What was Mr. Boggs' answer to your recommendations?

Mr. Wittschen: Same objection.

The Court: Same ruling.

Mr. Wittschen: Exception.

The Witness: A. Mr. Boggs stated he was satisfied that the concrete lining the section "A" as designed was adequate to hold the ground loads, however, he would call in his consultants and lay the matter before them.

(Testimony of Thomas L. Phillips.)

Mr. Smith: Q. That was the first conversation,—the sum and substance of the first conversation; is that right? A. That is correct.

Q. You said you had a second conversation in that same month, or second meeting, with Mr. Boggs?

A. Yes. We had the second meeting,—that was August 19th.

Q. What was the sum and substance of what was said at that meeting?

Mr. Wittschen: Same objection on all grounds previously stated.

The Court: The same ruling.

Mr. Wittschen: Exception.

The Witness: A. Mr. Tibbetts and I made further investigation of the tunnel; and felt it our duty to call the attention of the Contractor as well as the District Engineer to the serious condition of the tunnel; that is, the serious condition that might happen to the tunnel.

Mr. Wittschen: Pardon me. I might state the question was [1751] —I believe the witness answered the question. He was asked what he stated to Mr. Boggs.

The Court: The "serious condition" is a conclusion.

Q. Just repeat the conversation; what you said.

Mr. Smith: Q. What was the sum and substance of what you said to Mr. Boggs?

Mr. Wittschen: Same objection.

(Testimony of Thomas L. Phillips.)

The Court: Same ruling.

Mr. Wittschen: Exception.

The Witness: A. We told Mr. Boggs that the tunnel was taking very heavy ground loads, and the matter of hewing the timber sets out to a point where it would seriously weaken them, or the matter of entirely removing the sets, digging up the lagging and setting the timbers back to clear the designed concrete lining, was a very hazardous operation; and we urged him to permit the intrusion of some of the timbers into the outer line of the concrete section, and to compensate for strength, as we had previously talked to him on the 16th, to add reinforcing steel and install a strut over the highway section at the foot of the concrete lining.

The Court: Q. Did you know how long those timbers were there,—the supports? A. Yes.

Q. How long were they there?

A. Some of those timber supports were there as long as 6 or 7 months before they were concreted.

Q. They indicated, at that time, that they had a heavy load and were intruding?

A. Yes. Some had a very heavy load.

The Court: Proceed.

Mr. Smith: Q. Have you concluded with what you said or recommended? A. Yes.

Q. In sum and substance, what, if anything, did Mr. Boggs say?

Mr. Wittschen: Same objection.

The Court: Same ruling. [1752]

(Testimony of Thomas L. Phillips.)

Mr. Wittschen: Exception.

The Witness: A. Mr. Boggs said that he did not think he could possibly permit the intrusion of any of the timbers; however, he would take the whole matter under advisement.

Mr. Smith: Q. How long did these two interviews last, approximately, in length of time?

A. I think the one on the 16th lasted from about 9:30 or 10 o'clock until some time after 12.

Q. That is, in the morning?

A. In the morning; and the one on the 19th was in the late afternoon,—probably a two or two and a half hour discussion.

Q. On August 28th, you testified you were in the tunnels on the morning of that date?

A. Yes; I was there all forenoon.

Q. Did you notice the timbering situation in the north tunnel, particularly? Did you notice it?

A. Yes, I did.

Q. What was your observation, if any, as to the condition of the timbers that morning at the point where the cave-in occurred later in the day?

A. Well, I noticed a timbering, or a retimbering gang, I should say, working at that particular location. I don't recall the number of men in the gang; but there were probably about 8 or 10. They were working from a Jumbo, and were taking out the timber sets,—taking out the lagging behind the sets, and excavating sufficiently into the natural ground to permit the installation of the new sets so that it

(Testimony of Thomas L. Phillips.)

would clear the designed neat lines of the concrete lining.

Q. What did you observe as to the method being pursued by the Contractor and the workmen?

A. The work they were carrying on was along the general lines that are used by tunnel retimbering gangs.

Q. You observed or saw nothing unusual or out of the way in what [1753] they were doing?

A. No. Because of my acquaintance with such a vast amount of work of that kind on the Western Pacific, I was naturally looking to see if they had some new method, and they were following approximately the same method that we have used for several years.

Q. You went there, also, I believe you said, on the same day after the cave-in?

A. Yes. I heard about the cave-in, as I recall, about 7 o'clock, and I went directly over there.

Q. What did you observe, if anything, then,—just in a few words, generally?

A. I observed the tunnel was full of muck for a distance of 100 feet or more,—the floor of the tunnel; and it was apparent there was an opening 30 or 40 feet wide at the roof.

Q. Were you in the tunnel after August 28th, and particularly during the few weeks immediately following that date when the operations were suspended in the north tunnel as has been testified to in this case?

A. Yes.

(Testimony of Thomas L. Phillips.)

Q. Was some of the concrete work installed in the tunnel during that period on a similar suggestion for modification of the arch to that which you had made to Mr. Boggs in August? A. Yes.

Mr. Wittschen: Just a moment. May the answer go out pending an objection?

The Court: I may go out.

Mr. Wittschen: Objected to as immaterial and calling for an opinion and conclusion of the witness, and on the further ground that the suggestions of the witness were not not part of the contract.

Mr. Smith: I asked him what he saw, and he has already said he saw the same thing being done which was recommended to Mr. Boggs. That is all I wanted to show by that answer.

The Court: I will sustain the objection. [1754]

Mr. Smith: Q. Mr. Phillips, how many times were you in there later,—in the tunnels,—during the month of February, 1936, if you recall?

A. I do not recall just how many times. I recall, however, that I was in there on February 19th.

Q. You have examined such records as you keep to ascertain that fact, have you? A. Yes.

Q. You have heard of this cave-in, testified to here, on the 22nd of February? A. Yes.

Q. That was approximately three or four days before the cave-in, then—three days? A. Yes.

Q. Did you observe the conditions at the point where the cave-in occurred on the 22nd of February?

A. Yes. I recall distinctly of going into all of the heading drifts in the north tunnel on the eve-

(Testimony of Thomas L. Phillips.)

ning of the 19th, and also going up on the catwalk and into the top heading.

Q. What did you observe of the work being done upon that occasion?

A. Well, the work looked about the same as it had theretofore. There was spotty ground, and the timber was taking weight in places in the tunnels. I observed various places where it was taking weight. However, I did not see anything that was alarming at all in that immediate vicinity, not any more than in the usual driving of a tunnel.

Q. Did you go into the tunnel later, after the cave-in, that month?

A. Yes. I was there about 4 or 4:30, right after the cave-in; I think about two hours or so after the cave-in occurred.

Q. You mean in the morning of February 22nd?

A. Yes, in the morning.

Q. What did you observe then, just briefly?

A. Well, I observed that several of the timber sets had fallen down, and a great cave [1755] had formed on the right-hand side of the north tunnel, approximately at Station 126 plus 75. This cave, or cavern, was still visible; and the material was falling in chunks intermittently down into the lower section of the tunnel.

Q. Was the material of a different character than the ground more generally met with going through?

A. Yes; the material was white and dark mate-

(Testimony of Thomas L. Phillips.)

rial mixed in places and some of the pieces that came out were almost all white; seemed to be kind of a brittle material; it was dry; had no apparent strength; it just seemed like it was in an area on the right-hand side of the tunnel and it was very hard to tell how far it extended.

Q. Had you seen the excavation being made at that point where this cave-in occurred shortly before it occurred, or right near it?

A. Well, right near it; I wouldn't say I saw it exactly at that spot.

Q. How long before the actual cave-in occurred, if you know, was the excavation made there; a few days, or a long time?

A. Oh, yes, it was made several days before that; in fact, that section of the tunnel where the cave-in occurred was fully timbered when I was in there on the 19th; I am satisfied of that; I checked that up, however, from the records, to find out that.

Q. How close was the concrete lining of the tunnel to the caved-in portion?

A. Well, it was more than 100 feet; I could not say exactly how far that was, but I would say probably 150 feet back.

Q. Did you see the timbers that had fallen down, after the cave-in, that came out? A. Yes.

Q. Had they apparently been defective, or was it any fault of the timbers, as you noticed them?

A. No; there was not any broken timbers that I saw.

(Testimony of Thomas L. Phillips.)

Q. When did you next go in the tunnels after the cave-in, after the [1756] first visit you made shortly afterwards; did you stay there or around there?

A. I stayed around there until about noon, as I remember it; and I think, if I recall correctly, I was there the next day.

Q. Was the work of the Contractor delayed as a result of the August cave-in? A. Yes, it was.

Q. About how long?

A. At least, 60 days, and probably considerably more.

Q. Was the work of the Contractor unavoidably delayed as a result of the February cave-ins?

Mr. Wittschen: That calls for his conclusion,—the word “unavoidably.” That is for the Court to determine. I object to that particular question as asking for a conclusion that is not a matter of expert testimony to be construed by the contract. I have no objection to him stating how long in his opinion there was a delay.

The Court: “Unavoidably” will go out.

Mr. Smith: Q. Was the Contractor delayed as a result of the February cave-ins? A. Yes.

Q. What delays was he put to and for how long?

A. He was delayed because of the cave-in. It was necessary to squareset the tunnel.

Mr. Wittschen: The question was: “How long?”

Mr. Tinning: This is February; there was no squaresetting—

Mr. Smith: I will withdraw the question.

(Testimony of Thomas L. Phillips.)

Q. For how long was it delayed, Mr. Phillips, as a result of the February cave-ins, so far as you could observe?

A. My opinion is he was delayed at least 60 days.

Q. Going back to the August cave-in: what reasons delayed the work of the Contractor as a result of the cave-in?

A. The necessity for opening up the cave-in and concreting that section and [1757] allowing the concrete to thoroughly set before the forms and the squaresets could be removed so that the normal working conditions of the tunnel could be resumed.

Q. You saw what was done after the cave-in during the month of September and thereafter until the work of excavation was resumed, did you?

A. Yes.

Q. In stating the Contractor was delayed 60 days and possibly more, did you include the delay incidental to what was done afterwards before excavation was resumed further on in the tunnels; or do you attribute it directly to the work done at the point of the cave-in?

A. No; I attribute the estimate I have given you as the time delayed at each of the separate cave-ins, resulting in a considerable amount of anxiety from the Industrial Accident Commission.

Mr. Wittschen: I think the witness is going past the question. The anxiety of the Industrial Accident Commission will have to speak for itself in its letters and orders and not just a statement of that character. I ask it go out.

(Testimony of Thomas L. Phillips.)

Mr. Smith: It is not directly responsive; it may go out.

Q. Mr. Phillips, were there other delays indirectly resulting to the work, in addition or separate from the delays you mentioned as a result of the cave-ins? A. Yes.

Q. What were those delays and how long?

A. The squaresettings of the tunnels through the heavy ground section and the necessity for using wooden forms in concreting those sections.

Q. For how long did that delay the work, in your opinion?

A. That was somewhere between 30 and 60 days' delay.

Q. That is, in addition to the other delays you mentioned, which you attribute directly to the spot of the cave-in? A. Yes.

Q. Have you read the geology report, and examined the plans and examined the contract and the specifications, in this case? [1758]

A. Yes, sir.

Q. When did you do that?

A. I first saw the specifications and the geologist's report on August 5th. I made a trip——

Mr. Wittschen: Q. 1935?

A. 1935—I made a trip to Elko, Nevada, and, going and coming on the train, I went over the specifications and the geology report.

Mr. Smith: Q. You have kept yourself familiar with them since then? A. Yes.

(Testimony of Thomas L. Phillips.)

Q. Are you familiar with the clauses in the specifications concerning timbering and other clauses regarding the construction of the tunnel portion of the work? A. Yes.

Q. You are familiar with the time fixed in the contract for the completion of the work by the terms of the contract? A. Yes.

Q. Based on your knowledge of the facts, as you have testified, and on the documents themselves which you testified you were familiar with, what, in your opinion, was the progress which the Contractor could expect to make in tunnel excavation in the construction of these tunnels?

Mr. Wittschen: Objected to as immaterial and calling for the opinion and conclusion of the witness; and I particularly call the Court's attention that the rate of progress that he could make is not a matter of expert testimony. We further object to the injection of the geological report into the question, since it is no part of the contract. The Contractor was not required to bid on that. He took a contract to complete within 720 days. The evidence shows he was going to do it in 18 months, according to the first schedule. The opinion of the witness as to the progress that he should make is entirely beside the contract and immaterial.

Mr. Smith: The objection is not good, under the theory on which the plaintiff is presenting its case here, your Honor, and we [1759] would like to argue the objection to the Court, if your Honor desires

(Testimony of Thomas L. Phillips.)

argument upon it, because it is a matter involving expert opinion, in our judgment.

The Court: I am about to sustain the objection. Read the question.

(Pending question read.)

The Court: The Court is prepared to sustain an objection to that question.

Mr. Smith: Are you willing to permit us to discuss the matter with you before you rule upon it?

The Court: Certainly. I am only giving it to you so you can prepare yourself.

Mr. Smith: If it please the Court, this goes back to a position which the plaintiff takes in this case——

The Court: I have in mind the form of this question. Just let the reporter read the question again.

(Pending question reread.)

Mr. Smith: Well, there was no objection made as to the form by counsel.

The Court: Well, I had the question read for that reason.

Mr. Smith: It is a matter, your Honor, of asking for the opinion of this man who is certainly qualified as an expert on tunnels.

The Court: Q. Can you answer that question?

A. Yes, your Honor, I feel confident I can.

The Court: I am going to allow you to answer. I want to finish this.

Mr. Wittschen: Note an exception.

The Court: What is the answer? [1760]

(Testimony of Thomas L. Phillips.)

The Witness: A. About 10 feet per day in each tunnel.

The Court: "About 10 feet per day in each tunnel." Well, we got past that. Proceed.

Mr. Smith: Q. What are your reasons for making that statement?

Mr. Wittschen: Object to that as incompetent and immaterial and asking the witness to pass an opinion upon and construe a document which is for the Court to construe and not the subject of expert testimony, and also tying the geological report in, which is not part of the contract.

The Court: Read the question.

(Pending question read.)

The Court: Sustained. I have listened to reasons here for the last four or five weeks.

Mr. Smith: You have not heard the reasons given by this witness, your Honor.

The Court: Can he add anything to what has already been said?

Mr. Smith: I think your Honor is familiar with the code section which says an expert is entitled to give the reasons why he has expressed an opinion.

The Court: Oh, I am familiar with that.

Mr. Smith: And I think he will, your Honor.

The Court: In doing that, would it not be a repetition of what we have heard before?

Mr. Smith: No; I don't think anybody has stated what the anticipated progress would be, except Mr. Larson, who estimated the tunnels.

(Testimony of Thomas L. Phillips.)

The Court: I will let him answer.

Mr. Wittschen: Note an exception. [1761]

The Witness: A. That will take a rather lengthy explanation.

The Court: I anticipated that. Proceed.

A. In order to first make an estimate of the amount of progress that might be made in a tunnel, it must be first determined the kind of material or the character of the ground which may be encountered. After that is made, then, of course, comes the matter of organization, the matter of equipment and various other things.

The Court: We will all concede this tunnel could be dug more efficiently in the light of the experiences that we have all had since this work.

A. No; I don't think that is true, your Honor.

Q. You do not think that is true?

A. I think——

Q. I would like to ask you a question, myself; it may be helpful to me.

Now, after these cave-ins, they retimbered and they cemented the tunnels? A. Yes.

Q. At that very point and at that very time?

A. Yes.

Q. Why wasn't it done four months before?

A. It is customary to do all of the excavating through a tunnel before the concreting work is started.

Q. Yes. I am aware of that; but we had to have a disaster, and immediately when that occurred then

(Testimony of Thomas L. Phillips.)

we retimbered and then we see the necessity for finishing that off at that point.

A. Well, of course, that material had to be removed and so much additional timber put in as was necessary to concrete at that point immediately.

The Court: Yes. Proceed. [1762]

A. The most important thing in determining anticipated progress of the tunnel is to first come to a conclusion in your own mind as to the kind of material you expect to encounter and the rate of progress you can probably make in such material. Therefore, in this particular case, as I see it, the ground was represented to be self-supporting; this is borne out in the geologist's report, and in my opinion borne out in the specifications, and the contractor had a right to believe that he would encounter such ground; in other words, he had a representation of something that he did not find, and that is not a customary thing.

The Court: Do you think the geologist's report deceived him? A. Yes, it did deceive him.

Mr. Wittschen: I move to strike out the answer of the witness, particularly where he states the contractor was deceived by the geologist's report. The contract and the specifications provide that that is not to be considered in any way as a representation or an excuse for avoiding the contract or asking for additional compensation.

The Court: I am going to allow that to stand.

Mr. Wittschen: Exception.

(Testimony of Thomas L. Phillips.)

Mr. Smith: Q. What portion of the specifications do you have in mind?

Mr. Wittschen: Objected to as asking the witness to construe the specifications.

Mr. Smith: I am asking him to point out the part in the specifications.

Mr. Wittschen: It is invading the province of the court.

Mr. Smith: I am asking him to point out what portion of the specifications he had in mind. That is not invading the province of the court, at all.

[1763]

Mr. Wittschen: Let his Honor rule on that.

The Court: How is that subject to expert testimony?

Mr. Smith: I am just asking what portion of the specifications he had in mind.

The Court: He may answer.

Mr. Wittschen: Exception.

A. The one in particular in regard to the timber.

Mr. Smith: Q. Did those clauses regarding the timbering cause you to form the opinion that the ground would be self-supporting?

A. Yes, they helped to support that conclusion.

Q. That, in turn, was the basis of your conclusion as to the time the contractor would make?

A. Yes.

Q. Have you made an examination of the records of the company as to the progress that was made in the excavation on an average per day as against

(Testimony of Thomas L. Phillips.)

the 10 feet that you said the contractor should have made? A. Yes.

Q. How much was made, approximately?

Mr. Wittschen: Objected to as immaterial; the contract provides that the contractor shall do all of the work, and what he made has no bearing on this case.

The Court: I will allow him to answer with the hope that we will get through.

Mr. Wittschen: Exception.

A. About 4 to 5 feet.

Mr. Smith: Q. Your answer in that respect, does that include the time that the contractor was delayed? A. No.

Q. Was the 4 to 5 feet per day reduced by the delay? A. Particularly in the north tunnel.

Q. To what point was it reduced?

A. It was reduced to about $3\frac{1}{3}$ feet per day.

[1764]

Q. As I understand your testimony, then, the contractor would have made, would have had a right to make 10 feet per day and could only average 4 to 5 feet per day?

Mr. Wittschen: You repeat the answer in the question, and I object on the ground it has been asked and answered, and on the grounds previously stated.

Mr. Smith: I will withdraw the question.

Q. Was any delay suffered by the contractor as the result of the installation of reinforcing steel, in your opinion?

(Testimony of Thomas L. Phillips.)

Mr. Wittschen: Objected to as immaterial. The specifications provide that all the reinforcing steel that the District wanted might go in, and if they suggested their doing it they had no right to take advantage of the suggestion.

The Court: The objection will be sustained.

Mr. Smith: I would like, your Honor, to withhold your ruling until I suggest the purpose of the testimony.

The Court: I have listened to the purpose of the testimony heretofore. The Court has ruled.

Mr. Smith: Note an exception.

Mr. Alexander: We join in the exception.

The Court: Note an exception.

Mr. Smith: We offer to prove—I have a right to make an offer of proof, I assume, in connection with this?

The Court: Save your record.

Mr. Smith: We offer to prove by the question and the answer which the witness will give, the testimony which the witness will give in answer thereto, that the fact that the District greatly increased the amount of steel delayed the contractor; the testimony is not offered for the purpose of showing that the District did not have a right to increase the amount of reinforcing steel in the [1765] tunnel. The testimony will show that the District called for work done by the plaintiff, in approximately 10 per cent, of the work, installation of 300 per cent, as much steel, and in 50 per cent. of the work done by

(Testimony of Thomas L. Phillips.)

the contractor 200 per cent, as much steel, twice as much in 50 per cent, of the work and three times in 10 per cent. of the work. So as to make the illustration particularly appropriate, suppose they had ordered ten times as much steel, there could be no question that the contractor would have had to install it, we are not questioning that, nor are we offering to submit this testimony for that purpose, but we offer to prove that the contractor was necessarily delayed in the work as a result of putting in the steel. If there had been ten times as much steel installed that would certainly show the contractor suffered delay.

The Court: How much steel did they put in?

Mr. Smith: In 50 per cent, they put in twice as much, and in 10 per cent. they put in over three times as much.

The Court: Let us get the quantity. How much steel did they put in?

Mr. Tinning: That was testified to yesterday.

The Court: How much?

Mr. Tinning: Mr. Hindmarsh testified that in 50 per cent. of the tunnel extra steel was put in.

The Court: Of the entire tunnel?

Mr. Tinning: Of the entire tunnel, that is what he said.

The Court: If you have got a record on that what other record do you want?

Mr. Smith: We want to show how it would delay the work in the opinion of Mr. Phillips, who is an expert.

(Testimony of Thomas L. Phillips.)

Mr. Wittschen: The contractor agreed to put in whatever steel the District wanted. It must be assumed that was figured in the [1766] contractor's bid.

Mr. Smith: How could the contractor figure on the steel when the contract only called for one curtain, and they put in two curtains? They had the right to put in two curtains, but as we shall urge they must give us time. You cannot build a four-story house in the same time as a two-story house.

Mr. Wittschen: The delay was caused by the excavation. The steel went in and the concrete was within 125 feet of the excavation, so that only in 125 feet of tunnel would there be any delay. On top of that they subcontracted it.

Mr. Smith: That is not true. The work was delayed in fact and the witness will so testify.

The Court: I am concerned about one thing, no matter what this Court may do in this case, should there be an appeal, as I indicated at the outset, I want to give both sides a record, I want to be liberal, and I have got to keep that in mind. What is the question?

(Question read by the reporter.)

He may answer.

Mr. Wittschen: Exception.

Mr. Smith: You may answer the question. Did the installation of the additional steel delay the work. A. Yes.

Q. How much was the delay, in your opinion, and how was it delayed by that?

(Testimony of Thomas L. Phillips.)

A. It is pretty hard to tell how much it was delayed, but it is evident it was delayed, because it took a great deal longer to install the additional steel, and it took longer to place the concrete in the forms after the double curtain of steel was installed.

Q. How much timbering, in your opinion, was the contractor entitled to estimate was necessary to construct these tunnels under the plans [1767] and specifications, in ground of the character represented?

Mr. Wittschen: The same objection that was made on all of the grounds previously stated to a similar question on the excavation.

The Court: In the ground represented?

Mr. Smith: In the ground as represented.

The Court: Who represented the ground?

Mr. Smith: The District represented the ground.

The Court: I do not follow that.

Mr. Smith: Well, your Honor, the District gives notice to bidders inviting them to make a bid on a job. The bidder's attention is directed to the contract and specifications.

The Court: Yes.

Mr. Smith: To the proposed form of contract.

The Court: Yes.

Mr. Smith: And to the blueprints and drawings.

The Court: No doubt about that.

Mr. Smith: And to the geological report, which it states in the specifications is on file in the office of the District.

(Testimony of Thomas L. Phillips.)

The Court: Yes.

Mr. Smith: The contractor examines all of those matters, all of those documents, and forms an opinion as to what he is going to do in building these tunnels with that situation; he is invited also to make his own examination of the ground to the extent he could make it, which Mr. Larson did.

The Court: Wasn't he in the same position as the geologist who made the report?

Mr. Smith: Absolutely not, not at all.

The Court: Why?

Mr. Smith: I will tell you why, because the geologist's report is given to the owner, the District, and the District puts out that information for the purpose of guiding bidders as to the condition [1768] they will meet. That has been held in this Circuit.

The Court: I am clear on that.

Mr. Smith: And in the Passaic Valley Case it was held in the Second Circuit that even though the owners claimed that the contractor must not act upon it, that it does bind the owner; therefore, it becomes pertinent at this point and proper for Mr. Phillips to testify how much timber he would be justified in estimating he would use.

The Court: That is what I wanted cleared up. I may be in error. That is the reason I was inquiring. We have a geologist's report here that has been discussed from time to time. What would preclude the contractor from making a geological examination?

(Testimony of Thomas L. Phillips.)

Mr. Smith: 100 things, the first of which is the major obstacle; it would take months and longer to complete.

The Court: I can understand that.

Mr. Smith: And it would take long study, in addition to field work, which the contractor would not have time to do.

The Court: Is that all you have in mind?

Mr. Smith: That, I think, is sufficient.

The Court: I had that difficulty in mind.

Mr. Wittschen: Might I say the Passaic Case, nor the Sartoris Case that counsel says held the report as binding on the District, does not hold anything like that, and at the proper time I would like to argue it. I add to my objection that if it is a hypothetical question that it does not embody all of the things that should go into it. There is no representation as to any ground.

The Court: I will sustain the objection. Reframe the question.

Mr. Smith: Q. You stated, Mr. Phillips, that you have read the geological report.

A. Yes.

Q. And you are familiar with the conclusions therein stated? A. Yes.

Q. And you have read the specifications?

A. Yes.

Q. Examined the blueprints and plans?

A. Yes. [1769]

Q. And read the contract form?

(Testimony of Thomas L. Phillips.)

A. Yes, I have.

Q. And all of the pertinent documents that are mentioned in the contract? A. Yes.

Q. And you personally saw the tunnels during the time they were under construction, as you testified? A. Yes.

Q. You know the form of the bid that the contractor was required to make? A. Yes.

Q. Based on the information contained in the specifications and plans and the contract, and the geological report, how much timber was the contractor justified in estimating it would require to use in the construction of the tunnels?

Mr. Wittschen: Objected to as immaterial, and calling for the opinion and conclusion of the witness, asking the witness to construe documents that are not part of the contract, attempting to change the contract by parole, and invading the province of the court.

The Court: He may answer the question.

Mr. Wittschen: Exception.

A. Not more than one-fifth as much as was used.

Mr. Smith: Q. How much was used, do you know?

Mr. Wittschen: The same objection, on all of the grounds heretofore urged.

The Court: You may answer.

Mr. Wittschen: Exception.

A. I think there was in the neighborhood of seven million feet.

(Testimony of Thomas L. Phillips.)

Mr. Smith: Q. That was five times as much as should have been estimated, in your opinion?

A. Yes.

Q. You have estimated work in connection with the duties you have performed as an engineer, have you? A. Yes.

Q. What do you estimate in estimating for the construction of a tunnel, what elements do you consider?

Mr. Wittschen: Objected to as immaterial, and not aiding the [1770] Court in deciding any issue in this case. I have not tried to call your Honor's attention to any law, but if counsel is going to I am prepared to.

The Court: The objection will be sustained.

Mr. Smith: Q. Mr. Phillips, in duties which you have performed as an engineer have you exercised the powers of an engineer similar to those contained in the contract involved in this case?

Mr. Wittschen: Objected to as immaterial, and I have cases squarely in point that go to that very question. It is not a question of what was done by him in some other case, but what was done in this case, and that is for the Court.

Mr. Smith: That is what I am going to ask his opinion about.

Mr. Wittschen: I know you are, and that is why I am objecting on all of the grounds.

The Court: I am prepared to rule. The objection will be sustained.

(Testimony of Thomas L. Phillips.)

Mr. Smith: Would your Honor permit argument upon it?

The Court: No, I have ruled. You can ask him about something done in this case, not in other cases.

Mr. Smith: I was not going to ask him about other cases.

The Court: Your question did embody other cases. You asked him about other cases.

Mr. Smith: I will withdraw it and reframe the question.

Q. Have you had experience with the function of an engineer on a contract containing clauses conferring powers upon the engineer similar to those conferred in this case?

Mr. Wittschen: I object to that as entirely immaterial, and not binding upon this defendant in any way, and proving no issue.

The Court: What is the purpose of the offer?

Mr. Smith: It calls for merely a "Yes" or "No" answer as to [1771] whether he has had experience and is preliminary in laying a foundation for asking him what the practice is in connection with the facts of this case.

The Court: What facts?

Mr. Smith: The facts of this case concerning the right of the contractor to obtain an extension of time.

The Court: I will sustain the objection.

Mr. Smith: Note an exception.

Mr. Alexander: We join in the objection and exception.

(Testimony of Thomas L. Phillips.)

Mr. Smith: We offer to prove by the testimony of this witness that he has had experience in——

The Court: Now, wait just a minute. The Court has ruled; I want you to have a record, but I do not encourage the method of what you offer to prove. You have assigned your reasons, and the Court has ruled.

Mr. Smith: There has been nothing as to what the opinion would be. We offer to prove what the witness will testify to.

The Court: Proceed with your question.

Mr. Smith: With a statement of what he would testify to?

The Court: No, proceed along the line suggested. You ask the question and I will rule at the proper time.

Mr. Smith: Q. Mr. Phillips, have you exercised the powers of an engineer under contracts for construction work with clauses in them similar to those contained in the contract involved in this case?

Mr. Wittschen: Objected to as immaterial and calling for his conclusion as to whether or not the clauses are similar, and invading the province of the Court, and we are bound by what took place in this case and not in other cases.

The Court: The objection will be sustained.

Mr. Smith: Note an exception.

Mr. Alexander: We also join in the exception.

[1772]

Mr. Smith: Q. Mr. Phillips, have you read the clauses in this contract concerning the powers and

(Testimony of Thomas L. Phillips.)

duties conferred upon the engineer? A. Yes.

Q. You are familiar with them? A. Yes.

Q. Have you acted as an engineer under other contracts in a similar capacity to the engineer in this case?

Mr. Wittschen: Objected to on all of the grounds previously stated.

The Court: I want to give counsel a record. If he has some particular clause in the contract that he is relying on he can call attention to it.

Mr. Smith: I call the attention of the witness particularly to the language of Subdivision (e) of Section 6 of the General Provisions of the specifications found on page 5, regarding disputes, which reads as follows:—or is your Honor sufficiently familiar with it?

The Court: You may read it for the purpose of the record.

Mr. Smith: It has already been read into the record several times, unless your Honor wants it to be re-read.

Mr. Wittschen: Might I ask a question?

Mr. Smith: Yes.

Mr. Wittschen: Do you want to ask this witness if in his opinion as an expert he could settle the dispute in some other way?

Mr. Smith: Yes.

Mr. Wittschen: That is what I thought.

Mr. Smith: Not in that form.

Mr. Wittschen: I thought that was the intention.

(Testimony of Thomas L. Phillips.)

Mr. Smith: I did not want to ask him the question in the form that you were putting it, no, of course not.

Mr. Wittschen: Go ahead and I will object.

Mr. Smith:

"Disputes. To prevent disputes and litigation [1773] the District Engineer shall in all cases determine the amount, quality and acceptability of the work and materials which are to be paid for under these specifications. He shall determine all questions in relation to said work and materials and performance thereof, and all questions which may arise relative to the fulfillment or interpretation of these specifications on the part of the Contractor. His estimate and decision shall be final and conclusive, and in case any question shall arise between the Contractor and the District pertaining to the contract, the District Engineer's estimate and decision shall be a condition precedent to the right of the Contractor to receive any moneys under the contract."

Are you familiar with that clause, Mr. Phillips?

A. Yes, I am.

Q. Are you familiar with the clause which reads, in the same section, Subdivision (h):

"Interpretation of Plans and Specifications. Should it appear that the work to be done or any matters relative thereto are not sufficiently detailed or explained in the plans and specifica-

(Testimony of Thomas L. Phillips.)

tions, the Contractor shall apply to the District Engineer in writing for such further details and explanations as may be necessary, and he shall conform to the same as part of the contract insofar as they may be consistent with the original specifications and plans. In the event of any doubt or question regarding the true meaning of the specifications, the decision of the District Engineer shall be final. In the event of any discrepancy between any drawing and figures written thereon, figures shall be taken as correct."

Are you familiar with that? A. Yes.

Q. There is one more, subdivision (c) of Section 4, subject "Time", found on page 3 of the specifications, reading as follows:

"Extension of time. The time during which the Contractor is delayed in said work by Acts of God, or by stormy or inclement weather, or by any reason which, in the judgment of the District Engineer, [1774] unavoidably delays the work, shall be added to the aforesaid time for completion, provided that the Board of Directors approve in advance the written application therefor, which must be made by the Contractor for such an extension, before the expiration of the time limit fixed herein, or a duly granted extension thereof."

Are you familiar with that? A. Yes.

(Testimony of Thomas L. Phillips.)

Q. Now, basing your statement on those clauses which I have read, have you exercised the functions of an engineer under similar clauses?

Mr. Wittschen: I make the same objection, on all of the grounds previously stated.

The Court: I am going to allow it.

Mr. Wittschen: Exception.

A. Yes, I have.

Mr. Smith: Q. What, in your opinion, was the duty of the engineer here in connection with the granting of an extension of time to the plaintiff?

Mr. Wittschen: Objected to on the ground it is immaterial, irrelevant, and invading the province of the Court, and calling for the opinion and conclusion of the witness.

The Court: This may assist the Court. On some of these matters this witness may assist me. I have some definite thought about it, but he may change my view. I will allow him to answer.

Mr. Wittschen: Can I finish the objection?

The Court: Yes.

Mr. Wittschen: It invades the province of the Court, and asks the witness to construe the contract, and to make a different contract between the parties. I do not care to argue it, but there is a line of authorities that hold that that is improper.

The Court: He may answer.

Mr. Wittschen: Exception. [1775]

A. In my opinion it was the duty of the District Engineer to grant an extension of time for the

(Testimony of Thomas L. Phillips.)

reason that conditions were not found as they were expected to be found, and certainly over a period of two years there are a few days of inclement weather and other things that may be credited to the time of the contractor.

Mr. Smith: Q. Was the contractor unavoidably delayed, in your opinion?

Mr. Wittschen: I renew the objection on all of the grounds previously stated to the last question.

The Court: The Court will sustain the objection.

Mr. Smith: Q. In connection with the delays in connection with your handling of similar functions under other contracts what was the practice when the contractor asked for an extension of time?

Mr. Wittschen: Objected to as entirely immaterial.

The Court: The objection will be sustained.

Mr. Smith: Note an exception.

Mr. Alexander: Also an exception.

Mr. Smith: I offer to prove by this witness that in the exercise of similar functions which he has testified he does and has done that it is customary for the engineer to call in the contractor and to review the conditions on the ground with the contractor, consider the contractor's reasons, discuss the subject fully with him, and make a recommendation based on careful examination of all of the evidence concerning the subject, which was not done in this case, and the evidence shows it was not done.

(Testimony of Thomas L. Phillips.)

The Court: Proceed. The Court has ruled. The objection will be sustained.

Mr. Smith: Exception.

Mr. Alexander: Exception.

Mr. Smith: Q. What is the definition of overbreak as that term is [1776] used in a contract for excavation of a tunnel, Mr. Phillips?

Mr. Wittschen: Objected to as immaterial, calling for the opinion and conclusion of the witness upon a matter which is not ambiguous, and stated in the agreement.

Mr. Smith: It is purely a preliminary question,
The Court: You may answer.

Mr. Wittschen: Exception.

A. Overbreak is the amount of material that is removed from outside of the lines of necessary excavation.

The Court: We will take a recess now until two o'clock.

(A recess was here taken until two o'clock p. m.)

[1777]

Afternoon Session

THOMAS L. PHILLIPS,

recalled.

Direct Examination (continued)

Mr. Smith: Q. During the morning, Mr. Phillips, the Court asked you a question about why the

(Testimony of Thomas L. Phillips.)

concrete had not been kept any closer in connection with the cave-ins. Did you have something you wanted to add to your answer to the Court's question?

A. Yes. I would like to add that it would not have mattered when the concreting was done before the cave-in of August 28, 1935, because the timbers would have to have been moved back, anyway, and, from good authority, I have been informed that the settling of that timber into the concrete area occurred directly after it was placed.

The Court: Q. To be frank with you, the thing I had in mind was the method and manner of proceeding with the work. The methods employed here, I take it, were the most economical methods, under the conditions; is that true?

A. Yes, I believe it was, probably.

Q. If other methods had been employed, it follows that it would have been more costly than the methods here used?

A. No; not that it would have been only more costly, but would have retarded the operation of the work. Further, your Honor, the second cave-in occurred at a point about 35 or 40 feet back of the face and right directly over where the shovel and excavated material was being worked. It could not have been concreted at that point.

The Court: Proceed.

Mr. Smith: Q. Under the contract and the specifications here, was the Contractor justified in driving the tunnels from the west end only?

(Testimony of Thomas L. Phillips.)

Mr. Wittschen: Just a moment; object to that as immaterial and calling for a conclusion and opinion of the witness. It proves [1778] no issue.

Mr. Smith: The testimony is offered for the purpose of showing, your Honor, the Contractor was justified in estimating and figuring and planning that the contract could be performed and performed well within the time limit and properly under the representations contained in the specifications by driving from the west end only.

Mr. Wittschen: Could I add to my objection: it is argumentative? It is certainly apparent he could have driven from either end if he wanted to. There is nothing here to inhibit him in that; he was not prevented; and later on, he did drive from the east end.

Mr. Smith: The testimony will show, your Honor, that if the contract was submitted to any person skilled in the art of building tunnels he would have estimated to do the work in the manner in which the plaintiff in this case estimated to do it, namely, by driving from the west end only, because of the conditions that were held out and represented. We are entitled to have the opinion of an expert that that was the proper way to estimate these tunnels. That is the purpose.

The Court: Was it because it was the most economical way?

Mr. Smith: No. Because it was the intelligent way to do it.

(Testimony of Thomas L. Phillips.)

The Court: What would you base that intelligence on?

Mr. Smith: That is what the testimony will show: if any tunnel builder would have figured to do it——

Mr. Wittschen: There is nothing physically impossible about driving from either end.

The Court: It seems to me the answer to that is they were at liberty to construct the tunnels from either or both ends.

Mr. Smith: Your Honor, the specifications provided for muck [1779] disposal at the west end. Your Honor is familiar with that testimony. The facts are that the tunnels had a grade rise of four per cent commencing at the west end and going to the east end. The facts are that driving uphill from the downgrade side is the way to do it for getting proper drainage, particularly where the muck to be taken out of the tunnels is to be used in the embankments which are located at the end where the muck will come out,—the downgrade end. We want to show, in the opinion of this witness, the Contractor was justified in concluding that that was the intelligent way to tackle the job from the information furnished.

The Court: I don't know how the Court is going to measure that intelligence.

Mr. Smith: Well, the opinion of an expert is proper testimony upon which your Honor could base his conclusion.

(Testimony of Thomas L. Phillips.)

The Court: What is the question, Mr. Reporter?

(Pending question read by the reporter.)

Mr. Wittschen: It is not a question of justification. He could have done it that way; he could have done it any way he desired; and he did do part of it at the east end.

The Court: He attaches to that question "under the plans and specifications."

Mr. Wittschen: Well, he was not required to drive it——

The Court: I understand it fully. I will allow him to answer the question.

Mr. Wittschen: Exception.

The Witness: A. According to the location of the——

Mr. Smith: Q. Answer the question "Yes" or "No," and then give your reasons.

(Pending question reread by the reporter.) [1780]

The Witness: A. Yes. According to the location of the center line and the established grade, there was no room for the disposal of any of the material at the east end of the tunnels, because the grade and the center line connected up with the existing highway. The disposal area provided for material was all at the westerly end of the tunnel. The drilling of a tunnel from the lower end, or downgrade end, is a customary thing to do when there appears to be a sufficient amount of time to do the work in that manner.

The progress schedule, as filed by the Contractor in February, 1935, showed that this tunnel would

(Testimony of Thomas L. Phillips.)

be all driven from the west end; and this progress schedule,—there was not to my knowledge or from my inquiries any objection made by the District—

Mr. Wittschen: I ask that go out as not an expert's opinion, and argumentative.

The Court: It may go out.

The Witness: A. If the Contractor had chosen to drive the tunnel from both ends, it would have duplicated the amount of machinery and the equipment; and the topography of the locality was such that there was very little room for the establishment of such machinery and equipment at the easterly end. There was no space for disposing of the material; and, had the Contractor excavated a considerable amount of tunnel from the easterly end, to dispose of that large amount of material it might well have been that there would not have been enough suitable material from the westerly end to make the roadway embankments. Therefore, he would have had to have found enough material to make up the difference. If the material in the tunnel had been as represented, there is not any question in my mind but what the progress,—sufficient progress could have been made to have completed the tunnel from the west end within [1781] the time allowed in the contract.

Mr. Wittschen: I ask that the part beginning "if the material had been represented" go out.

The Court: It may go out.

(Testimony of Thomas L. Phillips.)

Mr. Smith: It is entitled to remain in, I think, as one of the reasons; he stated he read the documents.

The Court: The language "as represented" may go out.

Mr. Smith: The words "as represented"?

The Court: Yes.

Mr. Smith: Q. Does the effect of water have any bearing in your experience?

A. Yes; water has a great deal of bearing. If water had been encountered, as it usually is in tunnels,—it is not a constant flow; it fluctuates,—and it may well have been that more water would have been encountered in places than the pump installation would have taken care of. Therefore, there is a very great likelihood of flooding the tunnel, which would not only have been a delay to the Contractor but might have caused serious injury to the structure through which the tunnel passes.

Q. You are referring to water at the east end?

A. If the driving is done from the upgrade end.

Q. If the driving is done from the upgrade end. I think we were asking you a question about overbreak just at the beginning of the noon recess; and you had defined overbreak. In a tunnel of this size, what was the necessary amount of excavation that you observed had to be done under the conditions that were encountered and that you saw when you were in the tunnels from August of 1935 to June, 1936?

(Testimony of Thomas L. Phillips.)

A. The necessary excavation would extend to a line 3 inches, or approximately 3 inches, back of the lagging.

Q. How much would that be outside of the line of the designed concrete section?

A. 1 foot and 9 inches. [1782]

Q. Have you made a computation of what the yardage is in the neat section and in that extended section?

A. Yes, sir.

Q. In approximate figures. Did you also compute the actual excavation that was made by the Contractor?

A. Yes.

Q. What percentage of excavation beyond the necessary excavation was made by the Contractor, compared with the total excavation?

Mr. Wittschen: Objected to as immaterial. The Contractor had control of his own work, and presumably he excavated as far as he had to in order to set the timbers.

Mr. Smith: The testimony, of course, your Honor, is directed to showing by the amount of work the Contractor had to do in order to construct the tunnel, in order to show what was necessary for the Contractor to do, and the time that it did take them to do it. The design contained in the plans and specifications submitted by the District called for the installation of a neat section of concrete lining, with no design shown for the installation of any timbers outside of that line. In addition to putting a concrete lining in, the Contractor had to

(Testimony of Thomas L. Phillips.)

put, throughout the tunnel, permanent timbering, which took, as the witness said, a minimum space of 21 inches in width outside of the circumference or outside line of the designed concrete section. In addition to that, 3 inches is allowed behind the lagging, according to the answer the witness just gave; and it makes a total of about—well, that is in the 21 inches. In addition to that, there would be what is called “overbreak,” as he defined it; and we want to show the percentage of overbreak in this case was normal and in accordance with good tunnel practice, and that is all.

Mr. Wittschen: That is just what I objected to: and he said that was good tunnel practice, or anything of that kind. The Contractor had full control of his work. If he wanted to break over [1783] 6 inches or 21 inches or 30 inches, that was his privilege. He agreed to build a tunnel that had a concrete section of a certain width. The question of overbreak, what is normal in other tunnels, or whether it was abnormal or otherwise, is no concern of ours. They agreed to do it.

Mr. Smith: The point is: they did it as fast as could be done; and it tends to prove we were entitled to the time,—further time,—to do the job.

Mr. Wittschen: Well, let us suppose they met with flood control work: they agreed to do it in an impossible time; that is their business and nobody else's. They did not have to take the contract. So, I think all this evidence is immaterial.

(Testimony of Thomas L. Phillips.)

Mr. Smith: But the evidence shows what this amounts to in the specifications and plans and drawings and the geological report—

Mr. Wittschen: Are you claiming now that some drawings misled you, too?

Mr. Smith: Certainly.

Mr. Wittschen: That is the first time I heard of that.

Mr. Smith: Mr. Larson so stated. Mr. Larson stated there was no design for any timber layout in the drawings, and that customarily where timbers are—

Mr. Wittschen: No. He stated—

Mr. Smith: He certainly did.

Mr. Wittschen: If there was no design there, there was nothing that misled them.

Mr. Smith: That is the point. Where there is no design, it is no indication that permanent timbers will be installed; so the design confirms the—

Mr. Wittschen: I don't agree with Mr. Smith that the absence of a design has misled him. [1784]

The Court: There is much I do not agree with Mr. Smith about, and I am trying to protect this record. I indicated to both sides that would probably be the only comfort that one side would have when we are through. I know something about the practice here. When these matters go to the Circuit Court, there are offers of proof and rambling stories that never impressed me from the standpoint of any

(Testimony of Thomas L. Phillips.)

controversy. However, I have some definite ideas about those matters myself, all of which-an Appellate Court or anybody else may not have, but I still retain them until my mind is disabused of them. I am striving to get a full hearing and give a full opportunity to both sides; and I want to allow every reasonable latitude, and I have tried to indicate, without doing violence to anybody's rights, my state of mind without divulging on that point where our task seems useless here. Do I make myself clear?

Mr. Wittschen: Possibly.

The Court: With that admonition, again we will try to proceed and get the merits of this case.

Q. You may answer the question. Proceed.

The Witness: Would you read the question, please?

(Pending question read by the reporter.)

The Witness: A. About 8 per cent.

Mr. Smith: Q. Is that a normal amount of overbreak? A. Yes, it is.

Q. Referring to the shooting methods employed by the Contractor, did you observe them at all during the times you were in the tunnel?

A. Yes; a few times.

Q. Were the shooting methods adopted and pursued by the Contractor, so far as you know, entirely sound and in accordance with the usual practice?

A. Yes, I believe they were.

Mr. Smith: That is all. [1785]

(Testimony of Thomas L. Phillips.)

Cross Examination

Mr. Tinning: Q. Mr. Phillips, this morning I understood you to say that it was customary in tunnel construction to do all of the excavating and then follow through and put in the permanent lining?

A. That is customary in many places, and has been done in many tunnels.

Q. It has not been done in many other tunnels, has it, Mr. Phillips?

A. Well, a good many other tunnels.

Q. Well, what has been the usual practice in the San Francisco Bay region? Would you say it was customary to construct those tunnels by driving through the excavation and completing the excavation and then putting in the permanent lining?

A. Well, I am not fully familiar with all the tunnels in the San Francisco Bay area.

Q. Are you familiar with the Yerba Buena Tunnel on the San Francisco Bay Bridge?

A. No; not fully familiar with it.

Q. You were quite familiar with the Broadway Tunnels. Didn't you know anything about the Yerba Buena Tunnel that was being constructed at the same time?

A. Not very much; no.

Q. You know, as a matter of fact, that tunnel was not fully excavated before the lining was placed?

A. That might be true.

Q. Well, that is one exception to the custom that you testified to?

(Testimony of Thomas L. Phillips.)

A. I do not know anything particularly about the Yerba Buena Tunnel, as I testified to.

Q. Well, you are testifying, as to custom, as an expert; and I assume, from that, that you have in mind the custom throughout this vicinity where the Broadway Tunnel was built.

A. No; that is not my answer. I said it was customary in some tunnels to do that, and I know of several tunnels where such work has been performed.

The Court: Q. Tunnels that they had to support?

A. Yes, tunnels that they had to support. [1786]

Q. In this vicinity here? What one have you in mind?

A. Your Honor, I don't know of any tunnels in this vicinity where they were entirely driven before they were concreted. However, the Oakland Antioch Tunnel, which is in this vicinity, was driven and timbered and is still standing timbered about half of its length. The concrete was placed in there,—the major part of the concrete that was placed in there was several years, or a few years, after it was built.

Mr. Tinning: Q. Is it customary to have collapses, cave-ins, in tunnels during construction?

A. Well, it occurs occasionally.

Q. Would you say it was a customary and usual thing in the construction of a tunnel?

A. No; I wouldn't say it was.

(Testimony of Thomas L. Phillips.)

Q. They had a cave-in in the Oakland Antioch Tunnel, did they not, during construction?

A. I understood they had, yes.

Q. A cavity was in the roof, and had to be filled up? A. I heard of that, yes.

Q. I believe that tunnel was constructed about 1910 or '11,—somewhere in that vicinity. Since that tunnel has been constructed, it required a great deal of maintenance in the timber, did it not?

A. I think it does, yes.

Q. And it had to be concreted, in part?

A. Well, it has been concreted at least in part.

Q. And in a number of the tunnels that you referred to, that you directly had to do with, both during construction and during maintenance, you have concreted tunnels in ground that was difficult, heavy ground?

A. You refer to the tunnels in Alameda County?

Q. No; I was thinking particularly of some of those that you referred to up in the Western Pacific, in your work as the assistant [1787] engineer; I think you mentioned one called the Spring Garden Tunnel, where you concreted?

A. That is correct.

Q. So it is customary in tunnels that are timber lined in ground that has weight upon it, where you are able to do it, and it is safe to do it, to keep it safe for construction, to put a permanent lining in it?

(Testimony of Thomas L. Phillips.)

A. That depends on whether it is an economical thing to do or not.

Q. Entirely on whether it is economical; not on safety?

A. Well, the safety feature would probably be one of the considerations.

Q. Isn't that the primary feature, so the trains can go through and the tunnel won't fall on them?

A. Well, railroad tunnels are carefully inspected. I would judge, if it came to the point where it was figured that the tunnel timber lining was not safe to operate through, why, of course, some other lining could be constructed.

Q. If the maintenance of the timber comes to a point where it makes it justified putting in a permanent lining, that is an economical feature, is it not?

A. Yes; that is the proper thing to do.

Q. Do you know the Waldo Tunnel which is on the north approach to the Golden Gate Bridge?

A. I know where it is.

Q. Have you been through it, Mr. Phillips?

A. I have driven through it since it was completed.

Q. Did you know that that tunnel was lined before it was fully excavated?

A. Yes, I understood it was.

Q. Was that done in the customary manner?

A. I did not refer to all tunnels being held open and not concreted until they were completed as a

(Testimony of Thomas L. Phillips.)

customary manner. I said that was customary to do that in some instances. [1788]

Q. Well, I think, in fairness, Mr. Phillips, your statement was that it was customary to do all of the excavation and then put in the lining. Those are the words of your testimony.

A. I did not say in all the tunnels.

Q. Well, what tunnel were you referring to when you made that statement?

A. That was the custom on some of the tunnels that I know of, and that was our custom on the Western Pacific.

Q. Was the Western Pacific tunnel that was driven in 1903 and 1904, in Niles Canyon, driven all the way through and then the lining put in afterwards?

A. With the exception of the concrete at the west portal and a section of concrete under the point where the Spring Valley Water Tunnel crossed over it.

Q. There was considerable difficulty encountered in the construction of that tunnel, was there not? A. Yes, there was some difficulty.

Q. The contractor left the work before it was completed, did he not?

A. Well, the contractor left the work with an understanding of the company.

Q. On 15 minutes?

A. No. The contractor felt that he did not want to complete the work, and the company agreed

(Testimony of Thomas L. Phillips.)

that they would take it over. There was not any radical dispute or any trouble over it.

Q. What was the name of the company that constructed that tunnel?

A. E. B. and A. L. Stone Company.

Q. Were any of the Bechtels in that work for the E. B. and A. L. Stone Company? A. No.

Q. Were any of the Bechtels employed by the Western Pacific in the completion of the tunnel after the contractor left? A. No.

Q. Now, with respect to your statement regarding customary methods [1789] of driving a tunnel to do all of the excavating and then put in the lining: Do you know the Stockton Street Tunnel here in San Francisco?

A. May I call your attention that I did not say that.

Q. Will you answer the question and then call my attention to your explanation?

A. Yes, I know the Stockton Street Tunnel; but I did not testify that that was the customary thing to do in all tunnels.

Q. Do you know the vehicular tunnel at Point Richmond that parallels the Santa Fe Railroad Tunnel? A. Yes, I know where it is.

Q. Isn't it a fact that that tunnel,—the lining was put in before the excavation was completed?

A. I don't know.

Q. Do you know that? A. No.

Q. Do you know the Figueroa Tunnels, built in Los Angeles, on Figueroa Boulevard, in 1931 and 1932? A. I have heard of them.

(Testimony of Thomas L. Phillips.)

Q. Do you know, in those tunnels, that the lining was placed before the excavating was completed?

A. No; I do not know.

Q. And that the tunnel was supported against the core while the lining was being placed?

A. No.

Q. Those tunnels are tunnels somewhat larger than the Broadway Tunnels involved here. You don't know anything about that?

A. Well, I know it is quite a good-sized tunnel, but I don't know anything in particular about the construction or the construction methods.

Q. Do you know the construction methods of the Hollywood Tunnel? A. No.

Q. In Los Angeles. Do you know the Sepulveda Tunnel in Los Angeles? A. No; I don't.

[1790]

Q. Do you know about the Southern Pacific Bayshore Tunnel No. 4 here in San Francisco?

A. I know a little something of that, because that tunnel was just about finished at the time I came to San Francisco.

Q. Well, you know that that tunnel was lined before the excavation was completed.

A. I think probably you are right about that.

Q. Isn't it also true that Southern Pacific Bayshore Tunnel No. 1 was lined before the excavation was completed?

A. I am not so sure that I know about that.

Q. In arriving at your conclusion as to the customary and proper methods of driving the Broad-

(Testimony of Thomas L. Phillips.)

way Tunnel, didn't you make a study of the manner in which other tunnels in the Bay area had been driven?

A. Yes, of course I have done a good bit of thinking and reading about tunnels; and the tunnels that I have referred to as being driven through, and fully timbered where timber was necessary, was because I classed them by the kind of a tunnel it was. This tunnel was expected, or evidently expected, to be, from the geological report and the specifications, to be built through self-supporting ground. [1791]

Q. Will you please give us now a list and the dimensions of each of the tunnels which you used as a criterion in arriving at your statement that it was customary to do all of the excavation before putting in the lining, give us the location, the name of the tunnel, and the size?

A. A great many of these tunnels, in fact the major portion of them, as I understand it, on the Metropolitan Water District, in Southern California, were driven and timbered where necessary before concreting.

Q. What is the size of those tunnels?

A. I think they are about 16-foot tunnels, something of that kind, in size.

Q. Do you figure those comparable with a tunnel 35 feet in breadth and about 30 feet high?

A. Well, I would not make very much distinction in the size, so long as you expect to find the ground self-supporting.

(Testimony of Thomas L. Phillips.)

Q. You do not think the size has much effect upon the problem of how a tunnel should be driven?

A. Not a great deal, if you have good ground.

Q. You differ from Mr. Larson and some of the other experts who testified here earlier in the case?

A. I don't know that I differ from them.

Q. What about the character of materials through which the Metropolitan Tunnels were driven, were they comparable with these—there are some ninety miles of tunnels in the Metropolitan project. Have you seen the tunnels?

A. No, I have not seen the tunnels.

Q. Now, we have got the Metropolitan and you have not seen them. So your knowledge of what it might be is based upon reading, and from your reading did you ascertain that a very large proportion of these tunnels were through hard rock?

A. The character or hardness of the rock has very little to do with the driving of the tunnel, that is the supporting feature of the tunnel; it is the self-supporting feature that I am referring to.

[1792]

Q. Wouldn't you say that if a tunnel was driven through hard rock it was self-supporting?

A. If it was driven through hard rock?

Q. Yes.

A. Not necessary. Hard rock is sometimes very blocky and will not hold up any better than soft stone.

(Testimony of Thomas L. Phillips.)

Q. Then in the plans and specifications, would you say that the fact that no support was required indicated to you that any particular kind of material was going to be encountered by you?

A. It would not make much difference, so long as it was supposed to be and estimated to be self-supporting ground.

Q. Whether it was hard or soft, if it was self-supporting that would be sufficient?

A. That is correct.

Q. As a matter of fact, the Metropolitan Water District tunnels are largely driven through hard rock, are they not?

A. I presume they are, some in hard and some in not so hard.

Q. And much of the Metropolitan District water tunnels did not require any timbering?

A. I think the major portion of them required timbering.

Q. Did you ever see the White Water tunnel?

A. No.

Q. Right at Banning? A. No.

Q. Isn't it a fact that there is a tunnel some three miles in length in which there is not one piece of timber? A. I don't know.

Q. Do you know the San Jacinto Tunnel?

A. I have heard of that tunnel.

Q. Is there timber in that tunnel?

A. I understand that a great deal of that tunnel is not timbered.

(Testimony of Thomas L. Phillips.)

Q. Name one of the tunnels on the Metropolitan Water District that is timbered?

A. I am not familiar with the names in my mind at the present time, but I think probably it is a fact that a greater portion of the Metropolitan District tunnels were timbered to some extent before they were concreted. [1793]

Q. You are not able to name one of them?

A. No, I am not.

Q. Can you name one of them that was not driven from both ends? A. No.

Q. You do know they were driven from both ends, do you not? A. No.

Q. You apparently have a rather vague idea of the details of that operation?

A. That is right.

Q. Now, name us some other tunnels upon which you base your opinion that it was customary to drive through before placing the permanent lining?

A. The P. G. & E. drove a tunnel at their Pit plant No. 3 in Shasta County—I cannot tell you the length of the tunnel but as I remember it was 19 or 20 feet in diameter.

Q. In the Sierras?

A. In the Sierras. And as I remember it some three miles in length. I have been informed, and I believe correctly so, that that tunnel was driven its full length fully timbered before it was concreted.

Q. Were the timbers taken out before the tunnel was concreted?

(Testimony of Thomas L. Phillips.)

A. No, the timbers I think were concreted in.

Q. Through what type of material was that tunnel driven?

A. That was a variable type of material.

Q. Granite?

A. No, I do not think it was through any granite.

Q. What kind of material was it driven through?

A. Well, it was commonly called soft ground tunnel, or largely soft ground tunnel.

Q. You don't know the names of any of the types of material?

A. No; that does not matter much in tunneling.

Q. Was that tunnel driven from both ends?

A. I think it was driven from both ends and probably some side adits.

Q. Was it necessary to pump out from the adits, pump water?

A. I think it would be if they drove down hill from the adits, I think they would have drained on the uphill side.

Q. Was there water encountered in the tunnel in driving?

A. I don't know whether there was or not.

[1794]

Q. What other tunnels did you base your statement on as to the customary method?

A. That is customary with the tunnel work done on the Western Pacific.

Q. So that your custom that you refer to is based on your operations on the Western Pacific?

(Testimony of Thomas L. Phillips.)

A. Largely.

Q. And not around San Francisco Bay?

A. Except the tunnels of the Western Pacific that are around San Francisco Bay.

Q. Now, let's go back to some of these tunnels around here. Is there any tunnel on the Western Pacific that has a width equal to the width of the Broadway Tunnel? A. No, there is not.

Q. Is there any tunnel on the Western Pacific that has a height equal to the height of the Broadway Tunnel? A. No.

Q. Do you consider that there is any tunnel on the Western Pacific that is driven in comparable material to the Broadway Tunnel?

A. Yes, I think probably the two tunnels in Niles Canon are fairly comparable.

Q. Were those tunnels in Niles Canon driven from one end or both ends?

A. They were driven from both ends.

Q. When you said that there was no space to place the material being excavated if the Broadway Tunnel had been done from the east end, did you have in mind that some 25,000 yards of material was placed in the gulch along the Fish Ranch Road by Six Companies during construction?

A. Yes, I remember that.

Q. Under the terms and specifications in this case the contractor had a right, if he wanted to have some place to put the material, all he would have to do would be to build a highway in accordance with the plans and specifications?

(Testimony of Thomas L. Phillips.)

A. Yes, but my answer to that was that the District did not provide any space.

Q. The plans and specifications state that the contractor must find a place to waste all of the dirt that he was unable to waste on the District right of way, and it was up to the contractor, was it not? [1795]

A. I think that is correct.

Q. He did do that on the west side of the project, did he not, with a large amount of waste?

A. Yes, but the contractor at that time was apparently trying to, if possible, meet his completion date; therefore, he started to work on the easterly end and went to the trouble and expense of finding a place and hauling the material to the place of disposal.

Q. Now, with respect to delay, you apparently made a study of the contractor's records in this case, although you did not come into contact with it until August, 1935; you talk about delay, do you know anything about the time that the contractor started underground on this tunnel?

A. Yes, I know something about that.

Q. And that he stopped his work for three or four weeks in August of 1934 while the subcontractor finished the foundation of the west portal building?

A. That was ahead of my time.

Q. Did you consider that when you were discussing delay?

A. No, I did not.

Q. Did you consider the fact that when the contractor poured the west portal rings, the first ap-

(Testimony of Thomas L. Phillips.)

proximately 100 feet of permanent lining in this tunnel in October, 1934, that he had no concrete plant on the job?

A. That was before my familiarity with this work.

Q. Now, do I understand that all of your considerations of delay and all of this testimony with respect to contractor's delays on this job are from the time you first knew it?

A. That is correct.

Q. So that prior to the time that you came on the work, or took the work up, which I think you said was August 5, 1935—

A. That is correct.

Q. When you were going on a trip over to Nevada, you took up the [1796] plans and specifications and made a study and then you came back and inspected the tunnel on August 8, 1935?

A. I do not think it was the 8th, I think it was the 11th or somewhere along there.

Q. Your memory is probably better than mine. You have not considered in your estimate of delay anything prior to the time you took up the study of the project?

A. That is correct.

Q. You say the placing of the steel delayed the excavation of the tunnel?

A. The tunnel work was closed down because the timbers were showing weight, and in order to catch up with the concrete work and the placing of the steel did not necessarily delay the excavation,

(Testimony of Thomas L. Phillips.)

but it delayed the catching up of the concrete with the excavation so that the excavation could not proceed.

Q. If the contractor had followed along with the orderly procedure of placing the concrete lining and keeping it at approximately a uniform distance behind the excavated face, there would have been no delay attributable to the cause that you have just stated, would there?

A. That is true, but that needs a little explanation. The schedule submitted by the Six Companies to the District in February, 1935 provided for the concrete lining to start six months behind the excavation schedule. This schedule was submitted to the District and apparently no objections were raised, therefore the contractor figured that the schedule was satisfactory to the District.

Mr. Tinning: We ask, if your Honor please, that the witness' answer go out as a conclusion and not responsive to the question.

The Court: It may go out.

Mr. Tinning: Q. Mr. Phillips, if the contractor had followed the excavation with concrete lining in an orderly manner, 100 feet, or 200 feet, or any given distance, the placing of the steel would not have delayed the completion of the work, would it?

[1797]

A. I am not so sure about that.

Q. How could it have delayed the completion of the work?

(Testimony of Thomas L. Phillips.)

A. Well, the necessary time to place the forms, place the steel and the concrete might have taken as much time or more time than the actual driving.

Q. Well, do the records of the contractor show at any time when he was proceeding with the concreting in an orderly manner following along behind that he had any difficulty in keeping up with the excavation? A. No, I think that is true.

Q. It is true he had a 27-foot form, and when he kept his concrete up he was always able to keep his pour so that he would keep his form within approximately the same distance of the excavated section?

A. I think after the concreting was caught up that is probably about correct.

Q. How much longer would it take to place two curtains of steel in the concrete forms than it would to place one, in hours?

A. Well, that is problematical, because in the first place it depends entirely on how much steel is in each curtain, or how much more curtain there would be in two curtains than in one curtain.

Q. Of course, I am only a lawyer, but you said that there were two curtains placed; how much longer did it take on any of these places, I am not talking about where there had been a cave-in, but I am talking about a place of normal operation with forms, steel forms, and where there were two sets of reinforcing steel. As I understand it, I may be getting in deep water, but the plans provided for a

(Testimony of Thomas L. Phillips.)

standard integral reinforcement of a lining or curtain that was placed just inside of the lining over the tunnel and that where extra reinforcement was put in that it was raised about 18 inches above it, so that it was near the outside surface of the concrete. Am I correct about that?

A. Yes, you are correct. [1798]

Q. Take what was actually done in the tunnel at some place you have given this as a source of delay; tell me how many hours in placing one of these forms, placing the additional reinforcing steel in that manner, occupied?

A. Well, I could not tell you how many hours. The only thing I could possibly do to answer your question is to say that if the curtains were to be of the same make-up it would probably take at least twice as long to place two curtains that it would one.

Q. How long did it take to place one?

A. I don't know.

Q. How, then, if you don't know how long it would take, can you say it caused delay?

A. I know that it would take more time to place two curtains than it would one, and not only that, it would take more time to put in the concrete.

Q. Why does it take more time to put in two curtains than one?

A. Because there is twice as much work.

Q. Couldn't you put twice as many men on?

A. No, I doubt if you could work twice as many men under those confined conditions.

(Testimony of Thomas L. Phillips.)

Q. How many men did the Six Companies use in placing the steel?

A. I don't know how many.

Q. You don't know? A. No.

Q. So you don't know, Mr. Phillips, whether or not it would take them twice as long to place two curtains as one?

A. Yes, I am satisfied I do know.

Q. You think you do, although you don't know how many men they had on it, or whether or not they could have put additional men, or whether they did put additional men on?

A. No, I don't know, but I have had experience in placing steel in confined places, and I am satisfied it would take longer.

Q. You said a few minutes ago that the schedule furnished by the Six Companies on February 9, 1935, under which they planned to have the concrete follow the excavation by a period of six months. Will you [1799] show us what you mean on this, Mr. Phillips? I am showing you my copy of Defendant's Exhibit O.

A. This is substantially correct. That is what I had reference to.

Q. In other words, you referred to the schedule which was furnished which showed they planned to commence concreting on the 1st of May, 1935?

A. No, the 1st of June.

Q. The 1st of May?

A. I was off a line. That is correct.

Q. My memory was not clear on it and I was

(Testimony of Thomas L. Phillips.)

trying to be sure that we were talking about the same thing. What does this chart signify to you, Mr. Phillips, with respect to the word "concrete"? Where does excavation show on this chart? I guess that must be it started November 1, doesn't it?

A. I think that is correct.

Q. When you were talking about six months you were referring to May 1, as shown on this chart, and it is a fact that the excavation was started about November 1 after these first rings were put in?

A. Yes.

Q. When you went into this tunnel in August did you inspect the tunnel timber in detail?

A. Yes, I looked over the tunnel timber very carefully.

Q. Was the tunnel timbering system similar to the timbering system in the Western Pacific Railroad tunnels?

A. Yes, very similar.

Q. What was the difference in the system of timbering in the north tunnel from the standard system used by the Western Pacific Company in its tunnel timbering?

A. It was the same as had been used a great deal with the exception that a large portion of that wall plate was not continuous.

Q. And in the Western Pacific tunnels you used a continuous wall plate?

A. When we used a wall plate system we used a continuous wall plate.

(Testimony of Thomas L. Phillips.)

Q. For instance, in this Spring Garden Tunnel, did you have a continuous [1800] wall plate?

A. Yes, that was built, originally built with a continuous wall plate.

Q. Now, you went in the south tunnel and inspected the timbers, did you? A. Yes.

Q. At the same time? A. Yes.

Q. What system was used there?

A. Well, that system varied some; largely, however, it was with the sections of wall plate.

Q. That is, short pieces of wall plate under which there were three timbers, plumb posts, and that would support only the two rings?

A. Yes, substantially that.

Q. Did you find when you inspected the timbers in the Broadway Tunnel that they were tightly packed against the surrounding rock?

A. Yes. However, they were not always tightly packed down at the lower sections of the posts.

Q. You found those posts were in at the bottom in a good many places?

A. In some places the posts were in at the bottom.

Q. You found some places that the mud sills or mud blocks at the bottom of the posts were higher than the excavated floor of the tunnel, did you not?

A. Not higher than the excavated floor of the tunnel, as I remember.

(Testimony of Thomas L. Phillips.)

Q. Don't you remember finding that in any place?

A. No, not higher than the floor of the tunnel.

Q. How would you compare the workmanship, the quality of workmanship of the timber that was in the tunnel when you inspected it on August 5 or August 8, whichever it was, whichever date you went there, and the workmanship in the timbering in the tunnel that was done after driving was resumed in November, 1935? Was it the same?

A. Yes, I think it was substantially the same.

Q. You think it was the same?

A. Except that there was a different type of timber used in the south tunnel. [1801]

Q. We are discussing the quality of the workmanship.

A. Yes, the quality was about the same.

Q. How did the workmanship compare with the workmanship in the Spring Garden Tunnel?

A. In general the workmanship was about the same with the exception of possibly the solid backing of the lagging. Of course, in a finished timber-lined tunnel there is more attention paid to the appearance of the lagging in order to make it a complete job.

Q. Where lagging is used in a permanently timbered tunnel, I assume it is rather regularly placed, so that you get a better effect in the timbers?

A. Yes, that is right; they are probably more careful than they would be in temporary lining.

(Testimony of Thomas L. Phillips.)

Q. In your tunnel work that you did on the Western Pacific did you have your rings, entire timber rings, vertical, so that the segments of the arch are vertical, on the same plane with the plumb posts? A. Yes, that is right.

Q. So that the rings and the segments above the wall plate are practically above the plumb posts?

A. That is right.

Q. Did you find any timbers in this tunnel that the segments were not vertical above the plumb posts?

A. Oh, yes, I found some that were probably somewhat out of line.

Q. Did you find any that were as much out of line that the caps were entirely outside of the projection of the plumb posts of the roof?

A. No.

Q. You did not find any? A. No.

Q. Did you find any places where the joints of the segments of the arch were open as much as one inch or two inches?

A. Yes, some of them were open. I could not tell you whether they were open that much or not.

Q. Did you find any places where the aggregate opening between the [1802] various joints of the seven segments of the arch were in excess of six inches? A. No.

Q. If there had been such timbering as that in the tunnel it would have been weak timbering, would it not?

(Testimony of Thomas L. Phillips.)

A. It would probably have shown a great deal of pressure, that is, if the arch had come down to a point where the points of the segment were carrying the load.

Q. That would not be a good condition of the timber, would it?

A. It would not be a good condition of the tunnel, it would show very heavy ground.

Q. When you went in there inspecting that tunnel did you find any place where the mud sills were above the actual excavated bottom of the tunnel?

A. No, not to my knowledge.

Q. Did you find that the bottom of the plumb posts were placed on a uniform grade?

A. No, they were not on a uniform grade.

Q. It is not good practice, is it, to place plumb posts, the bottoms of the plumb posts on different elevations?

A. I do not think it makes any difference so long as they are going to be encased in concrete.

Q. You don't think that it makes any difference if you have to excavate a foot wall trench below them to have some of them standing up above the top of the foot wall trench?

A. Of course, that would make a difference if you had to go too deep below the posts for a trench.

Q. You studied the construction of this tunnel, Mr. Phillips, and you know, don't you, that it was necessary, where the mud sill was placed above the bottom of the designed section of the pavement to

(Testimony of Thomas L. Phillips.)

go down with a trench to place the foot wall for the concrete lining?

A. Yes, and that was actually done.

Q. You also know that in many places the plumb posts were installed above this excavation and at varying elevations above it? [1803]

A. Yes, they were not uniform with the grade of the tunnel in all instances.

Q. It is also true, is it not, that when you visited the tunnel on the morning of the 28th of August, 1935, that there were some 900 feet of foot trench standing open in the tunnel?

A. There was a considerable amount.

Q. With water in them?

A. Some of it had water.

Q. And in some places the plumb posts were actually hanging over the edge of the trench, a portion of it?

A. No, they were not hanging; they were over, but they were braced so that they could not come in.

Q. Braced by having a diagonal brace four or five feet above the bottom against the railroad track ties, or something else on the floor of the tunnel?

A. They were thoroughly braced against the ground.

Q. Do you think that was a safe condition?

A. It probably was not the very best practice, but however no posts came into the trench when it was in that condition.

Q. None of the posts came in?

A. No.

(Testimony of Thomas L. Phillips.)

Q. The contractor had some luck. I am going to show you Defendant's Exhibit J-4, which is the timber diagram of the timber installed in the north tunnel from station 122 to station 130, approximately, and I will ask you to examine that timbering and ask if in your judgment that timbering is comparable to the kind of timbering that was placed in the Western Pacific Railroad tunnels, as to alignment?

A. I think it is a good timber job.

Q. You think it is? A. Yes.

Q. For instance, let us look at a set here at 125+12, where you have segments running around—the segment isn't over the plumb posts, is it?

A. That is not necessary. [1804]

Q. That is not necessary? A. No.

Q. You think that is good practice?

A. That is all right; the wall is built strong enough to hold it.

Q. Even in the area of a heavy ground?

A. With an exceptionally heavy load it might be different.

Q. If you had a heavy load on these timbers placed as I have shown them to you at this point they would not sustain when they are placed in that manner the maximum load that the same sized timbers placed vertically above the plumb posts would sustain, would they?

A. There would be very little difference.

(Testimony of Thomas L. Phillips.)

Q. There would be very little difference?

A. Yes. [1805]

Mr. Smith: Q. What station were you referring to?

Mr. Tinning: I think, 125 plus 10.

Mr. Smith: 125 plus 10?

Mr. Tinning: Yes.

Mr. Smith: And which tunnel is that in?

Mr. Tinning: North tunnel.

Q. We have here, apparently, all of the different varieties of timbering that were used in the tunnel. We have the three plumb posts under the short wall plate. I am now pointing to 123 plus 30. That is what you stated was in the south tunnel?

A. Yes, there was some of that in the south tunnel.

Q. Is that comparable in strength to timbering which is put in by the wall plate?

A. Yes, I think it is.

Q. Equal? A. It is probably equal.

Q. Why was the wall plate put in the rest of the tunnel?

A. Because of the convenience in driving.

Q. It is a matter of method, not of strength?

A. I think so. I think the timbers would be of equal strength.

Q. Would you say, referring now to Station 123—well, between 123 plus 00 and 123 plus 10, the set I am showing you here now, which indicates that the segments were out of line toward the west

(Testimony of Thomas L. Phillips.)

portal, would you say that that was a good piece of timbering? A. Yes, that is all right.

Q. That is all right. You allow that in your Western Pacific tunnels?

A. Yes. We don't install them that way, if we can possibly help it; but, however, it happens sometimes. We make no exception about the timbers.

Q. When you come to 123 plus 70, the timbers that show there where we find a segment starting on the wall plate, a short wall plate [1806] above cross adit No. 2, and swinging out of line and back again; do you consider that that is good timbering?

A. Yes, that is temporary timbering in the tunnel.

Mr. Smith: Were those last named stations in the north tunnel?

Mr. Tinning: They are all in this exhibit, yes.

Q. Now, I understood you to say this morning that as a result of the advice that Mr. Tibbitts and you gave Mr. Boggs in this conference on August 16th and 19th that he increased the steel that was being installed in the concrete lining

A. No. I did not say "as a result"; at least, that was not my intention. But the amount of steel in the lining was increased immediately after our visit to Mr. Boggs.

Q. Your visits were on August 16th and August 19th, were they not, Mr. Phillips?

A. Yes, that's right.

Q. Isn't it a fact, after—Isn't it a fact that the

(Testimony of Thomas L. Phillips.)

first pour with the steel forms which were brought on the job about July 1st was made in the upgrade tunnel on July 20th?

A. I don't know the date.

Q. Have you gone into these records?

A. Well, I wouldn't have them right at the tip of my tongue.

Q. Then, if there was a pour made on July 20th, and a pour made on July 27th, and a pour made on August 5th, and a pour made on August 10th, in the tunnel, those were the first four settings in steel forms in the south or upgrade tunnel, and isn't it a fact, Mr. Phillips, that in each one of those pours there was a double curtain of reinforcing steel?

A. I don't know.

Q. You don't know. Then, why did you say the steel was increased after you gave this advice on the 16th and the 19th of August to Mr. Boggs?

A. That was my understanding from the records I examined. [1807]

Q. Isn't it also true that the first pours that were made in the north tunnel with the steel forms,—I am referring to the first pour made after the rings were put in at the west end,—were made on August 8th, August 13th, August 19th and August 23rd?

A. I don't know the dates.

Q. Isn't it a fact that the pour made on August 8th and the pour made on August 13th, which was before you saw Mr. Boggs, were both made with the double curtain of steel?

A. No; I don't know.

(Testimony of Thomas L. Phillips.)

Q. You don't know. But, if that be a fact, then it would not be true that the steel required by the District Engineer was increased following your visit to see Mr. Boggs?

A. I wouldn't say that, because the amount of steel may have been increased.

Q. Well, you don't know that it was, do you? You apparently don't know what went on before at all, Mr. Phillips?

A. Before August 5th?

Q. Before the time that you talked to Mr. Boggs, you don't know how much steel was used?

A. Well, that is perfectly true.

Mr. Tinning: No further questions.

The Witness: I have probably been misinformed on that. My understanding was that the steel was increased after that certain date.

The Court: Is that all from the witness?

Mr. Tinning: No further questions.

The Court: We will take a recess.

(After Recess)

Redirect Examination

Mr. Smith: Q. In cross examination, in answer to a question about a tunnel that had been fully driven without permanent concrete lining being installed, you mentioned the only one you knew [1808] of, in this vicinity, was over in Niles. Do

(Testimony of Thomas L. Phillips.)

you know of another one that you forgot to mention?

A. Yes; on the Western Pacific tunnel through the Potrero Hills in San Francisco.

Q. That is the tunnel you mentioned on your direct examination this morning as work you had been doing? A. Yes.

Q. Was that tunnel timbered throughout?

A. It was timbered throughout by the wall plate system, and stood for many years without the necessity for any retimbering.

Mr. Smith: That is all.

Mr. Tinning: No questions.

OTTO W. PETERSON,

Called by the plaintiff; sworn.

Direct Examination

Mr. Smith: Q. Where do you reside, Mr. Peterson? A. 6209 Rockwell Street, Oakland.

Q. What is your present occupation?

A. My present occupation is construction engineer with the Pacific Gas and Electric Company.

Q. You are connected with that concern on a permanent basis? A. Yes, sir.

Q. Will you state to the Court when you first engaged in engineering work, and, particularly with reference to tunnel work, state your experience in connection with tunnel work from the beginning to

(Testimony of Otto W. Peterson.)

the present time, and, where you mention that tunnel work that you have had anything to do with, will you state your function or duty and the way the work was handled by you, and what the tunnels were, and their dimensions? You heard the testimony of Mr. Phillips this morning? A. Yes.

Q. More or less along the same lines.

A. My first practical experience was in the summer of 1932. I was—— [1809]

Q. 1932?

A. 1902. I worked as a rod man and chain man in Fresno County, California, for the Division of Agriculture—the Department of Agriculture, rather. Following that, I went to Southern California. I worked for Mr. J. B. Lippincott, and for the United States Geological Survey for one year's time, mainly on underground water tests and measurements, and on surface water measurements. Following that, I attended the University for a final year of civil engineering.

Q. What university?

A. University of California; graduating in May, 1904. I then spent a year's time on field work, making measurements of surface waters in the State of California for the United States Geological Survey. Following that, I went to Yuma, Arizona, on surveys and general office work, locations, designs and so forth, connected with the Yuma Irrigation Project.

Q. Who was the owner of that?

(Testimony of Otto W. Peterson.)

A. That work was for the United States Reclamation Service. Mr. Lippincott was the supervising engineer, at the time, of that division.

Q. In what years was that?

A. That was in 1905 and 1906. I resigned from that employment to work for a contractor,—the Spring Construction Company,—in about the spring of 1907; and was engaged on street and sewer and general improvement work mainly in Berkeley for a period of about 5 months. I was then offered employment as construction engineer for the California Development Company on work connected with the closing of the Colorado River break; and I went down to the Mexican border and was the engineer on the levee construction in Mexico connected with the closing of that break for a period of about the better part of one year. I also did some other incidental work connected with river control in Lower California during that period, or the lower part of the Delta region below the Imperial Valley. [1810]

My next employment was with the Orland Irrigation District in Glenn County in 1908, where I was in charge of their first construction, building a diversion dam, as engineer and superintendent and in various works of estimating future construction.

Q. Was that work done—

A. That work was done directly by the United States Reclamation Service with their own forces.

Q. How long were you there?

(Testimony of Otto W. Peterson.)

A. I was there about one year. I then went with the City of Los Angeles on construction of the original Los Angeles Aqueduct in 1909, at least as a foreman or general foreman, or superintendent, of one of their camps, and doing steam shovel excavating and concrete lining for the covered conduit sections for a period of several months. I was then moved to a similar division or section of work, mountainside work,—somewhat more difficult; steam shovel work and concrete lining construction. Following that, I was placed in charge of two divisions of work,—a section of 40 miles, steam shovel excavation and concrete lining along the easterly slope of the Sierra Nevadas in Inyo County. I was on that work a total of four years' time.

Q. That work was for the account of the City of Los Angeles?

A. That work was for the account of the City of Los Angeles; and, except for very incidental features, was built entirely by City forces and employees.

My next employment in the spring of 1913 was with the Pacific Gas and Electric Company, as superintendent in charge of the Drumm Power Project in Placer County. I was superintendent of this particular project, and also acted as an assistant to the general superintendent of the Company, and was engaged at the time in the building of Lake Spaulding Dam and the Spaulding Tunnel and other work. This project involved the building of

(Testimony of Otto W. Peterson.)

about 7 miles of mountainside [1811] canal, various flumes, a reservoir on top of a hill, a forebay on which we used a great number,—some 500 mules or so, in scraping and moving of dirt, pipelines, a power house; and, in connection therewith, there were two tunnels,—two soft ground tunnels: one about 500 feet, 12 by 12 in size, timbered, and not concrete lined at that time; and the second tunnel, of about 10 by 10 in size, through soft ground, several hundred feet long, also only timbered at that time.

The Court: Were those tunnels cemented later?

A. About 15 years later, those tunnels were concreted. In addition, we were, at that time, building a hard rock tunnel about one mile long from Spaulding Dam to the head of Bear Valley, this tunnel being about 12 by 12 in size. Following the completion of that work, I was employed by the Eastbay Water Company to make a valuation of the properties in the early part of 1914. This was mainly a valuation job, with a staff of some 50 or 60 assistants, covering the physical properties of the Company,—a valuation being made at that time for refinancing purposes, or to give information to be used for refinancing purposes.

Leaving that work after about 6 months' time, I was employed by the United States Reclamation Service and the State of California jointly, to make a final investigation and report on the Pit River area in northeastern California, covering the possi-

(Testimony of Otto W. Peterson.)

bility of development in irrigation, power and so forth. In connection with that work, I made estimates on several dams and incidental structures, and made a report. I was next employed, for a period of about 11½ years—

Mr. Smith: Q. Commencing in what year?

A. Commencing in,—I think, in 1915, and running into 1916, by the Modesto Irrigation District as a construction engineer in charge of the [1812] reconstruction of their major works, their canals, reconstruction of two dams, the replacement of a number of flumes,—timbered flumes,—by hydraulic fills, the enlargement of a tunnel. A large part of the canal was lined with concrete, and over these hydraulic fills we built reinforcing concrete flume structures. The tunnel on that particular project was unlined,—an unlined tunnel through a hardpan formation. The size originally was about 12 by 12 feet; the tunnel, being about 2,000 feet long, was enlarged without the use of any timber. It was arched and stood unsupported.

Q. Was that work done under your supervision by forces—

A. No. Most of that work,—practically all of the work on the project, or all of it—there may have been minor exceptions—was done by various contractors; and I acted as the clearing agent for the district in the dealings with those various contractors.

Q. What were your particular duties in connection with the tunnel: merely supervisory; or did

(Testimony of Otto W. Peterson.)

you have physical duties in connection therewith?

A. Well, the enlargement work was done by a contractor. I had charge of the plan for the enlargement and supervised handling the work for the district in the dealings with the contractor and in executing the work.

Q. What followed that?

A. Next, I returned to the Pacific Gas and Electric Company about the end of 1916, I think, or the first part of 1917, mainly for the reason for the addition to the Spaulding concrete Dam and the building of three supplemental dams required at that place. After the work on these dams was completed, I had charge of the building of two tunnels in the vicinity of Auburn, with a total length of about one mile or $1\frac{1}{2}$ miles. These tunnels were, in part, driven through soft ground and, in part, driven through very hard material. A considerable portion of the tunnels [1813] was lined with timber at the time and subsequently have been concrete lined.

Mr. Tinning: May we have the size of the tunnels?

A. The size of the tunnels was about 9 feet. They were small tunnels.

Mr. Smith: Did you ask a question, your Honor?

The Court: I was going to ask for the size.

Mr. Smith: Q. Was that work done, including the tunnels, by company forces?

A. All of that work was done by contract. The raising of the dam was done by Twohy Brothers,

(Testimony of Otto W. Peterson.)

and the work on the tunnel was done by a contractor who is no longer in business in this locality. Also, in connection with that period of employment with the Pacific Gas and Electric Company, I maintained the headings of a proposed 7-mile tunnel through the Big Bend of Pit River. That property had been purchased from a company called the Mount Shasta Power Company, and it was proposed, at the time, to carry a 7-mile tunnel through the Big Bend of Pit River for power development purposes. These particular tunnels were in very heavy ground,—swelling ground; and we maintained them and also drove them forward a distance of probably 1,000 feet each, maintaining the timbering during that time.

Q. They were not constructed, at that particular time, in full?

A. No. The major tunnel was not constructed at that time. I then took a leave, or was permitted to leave the Pacific Gas and Electric Company for a consulting job in Korea, which was supposed to take about a month's time in the early part of 1918. I went over there to look over a power project for the Oriental Consolidated Mining Company, commonly known as the American Mining Concession in Korea; inspected a proposed dam site, a tunnel, a power project; [1814] tested the feasibility of this proposed development, and made plans and designs; and, as these things, developed, they necessitated that I stay out there, so I continued to obtain the

(Testimony of Otto W. Peterson.)

necessary permits from the Japanese officials and proceeded with the construction of the work, with the assistance of several men that I obtained from the mines,—several young men who acted as assistants, and some Koreans who were able to assist; and I carried on that work with about 500 Korean workmen, about 500 Chinese, and built a masonry dam over one of their torrential rivers, and a hard-rock tunnel about 14 by 14 feet in size and about 2,000 feet long; and the other features of this power development, finishing the work in the summer or early fall of 1919, after 1½ years' time. Also, during my stay in Korea, I did consulting work for the French Mining Concession on a proposed power development involving estimates for tunnels and other purposes of construction, and for some Japanese associated on a government irrigation project, the main feature of which was a high concrete dam. [1815]

I returned to the United States in the fall of 1919, reentered the employ of the Pacific Gas & Electric Company, and started the work of building Pit 1 tunnel, which was a two-mile tunnel, carrying water from the Fall River, a tributary of Pit River, in Shasta County, through a mountain divide, this tunnel being about 14 feet in diameter inside of the concrete lining, and two miles long. The tunnel was driven through volcanic material in the main, all of which required timber support. The tunnel was built under a contract with the Orlandi Com-

(Testimony of Otto W. Peterson.)

pany, and at the completion of that job we had a settlement to make which was accomplished without going into court, which was satisfactory to the company and to the contractor. I did not remain following the finish of that work but left the Pacific Gas & Electric Company for a period of five months, and started in the summer of 1920 to accept employment with the Shattuck Construction Company, on a contract which they had just taken to complete the building of Tunnel No. 1.

Q. Is this the same tunnel No. 1 you mentioned?

A. No, this tunnel No. 1 is located in Plumas County, and was under construction for the Western Power Company, to carry water for power purposes from Lake Almanor to Butte Valley. This tunnel had four main shafts on it, the deepest of these shafts being 400 feet. During the period I was there I completed the sinking of one shaft, which was the source of a great amount of trouble; the lower end of that shaft was completed in what appeared to be an old river channel in sand formation, and we carried on the driving of the other headings, about six in number, from the west portal, from C shaft. After this shaft was finished I went over to B shaft about 350 feet deep, and over to A shaft, which was about some 200 feet deep. This particular tunnel was an unusually wet one, containing the very wet ground, in fact at that time it was considered to [1816] be the wettest tunnel so far driven in California; after a period of eight

(Testimony of Otto W. Peterson.)

years it still has leakage in excess of 6,000 gallons coming into it after standing empty without having water flow through it for a period of seventeen years.

Q. Can you give us the dimensions of that?

A. The dimensions of that tunnel finished inside of the timbers is about 7 feet in the width of the floor and about 7 feet between the floor and the timber lining at the top. It is almost entirely timber lined. In addition to the usual timber it had timber side walls inside of the timber sets and timber lines, so it is in effect an underground system.

Mr. Tinning: Q. Did you say 6,000 gallons an hour?

A. 6,000 gallons a minute, is the normal leakage that still comes into that tunnel after a period of about eighteen years.

I was then offered employment by the Pacific Gas & Electric Company about the first of 1921 to take charge of all of the major construction work of the company. They wished particularly to have me take charge of the Pit River construction which was just getting under way on a large basis, so I returned to the Pacific Gas & Electric Company and carried through the completion of the Pit 1 tunnel. We contracted for the actual construction, and I represented the company. We built the Pit 1 power plant and two power plants on Hat Creek, initially, and then in 1923 we proceeded with the building of Pit 3 power plant, which involved the

(Testimony of Otto W. Peterson.)

building of a dam and tunnel of four miles in length, 19 feet diameter inside of the finished concrete.

Q. How large was the excavation?

A. The excavation of the tunnel being about 23 feet by 23 feet inside, the tunnel being entirely timbered and subsequently lined inside of the timbering; and also in connection with the project the usual pressure pipe lines and [1817] power house, etc. While this work was going on we also had other construction involving the addition to the Lake Spalding Dam, and plant construction, etc. About 1926 we had other construction come along, one of the tunnels being the Melones Tunnel in Tuolumne County, which was about a mile in length, the lower end of the tunnel being on a steep incline. This tunnel was in hard rock formation about 14 feet by 14 feet in size, inside of which the concrete lining of which was placed with the use of very little timber, and we enlarged Spalding Tunnel, and the hard rock tunnel, and also built several small tunnels in Placer County, short tunnels of a quarter of a mile or less in length, and some were gunited and some concreted; and one tunnel under the reservoir in Placer County at a place called Drum. This tunnel was about one mile long, fully timbered, in soft ground; we lined that by moving in sections of precast pipe about five feet in size, I believe they were, joined them together, and we also enlarged about six other tunnels in Placer County

(Testimony of Otto W. Peterson.)

which were about 12 by 12 size, and outside in the neighborhood of 16 feet size, and lined them in the main with a reinforced granite. In 1928 we undertook power development work on the Mokelumne River, involving in the main a large rock fill dam, 20-mile conduit, power house, pipe lines, etc. Incidental to this work there were constructed an outlet tunnel from the reservoir of about 20 feet or 22 feet in size, lined with concrete, to a diameter of 19 feet, about 6 small tunnels aggregating about a mile in length and about fourteen feet by fourteen feet in size, some through hard rock and some through rock which was hard granite, but blocky and fractured, and requiring timber support; some through slide material, requiring quite heavy timbers; and in addition one two-mile tunnel of about 11-foot size, which was driven through hard rock and did not require concrete lining. About two [1818] years ago we undertook the building of an eleven and one-quarter mile tunnel in Stanislaus River which was 11 feet in size through hard rock formation. That tunnel has been under way for something less than two years time and is now one-half finished.

In addition to the work which I have described I also had charge of steam plants, sub-station construction, and in the last seven or eight years all construction of the company, including pipe lines, pole lines, power lines, miscellaneous work, a lot of maintenance of tunnels and dams and water conduits.

(Testimony of Otto W. Peterson.)

Mr. Smith: Q. During the construction of these various tunnels for the Pacific Gas & Electric Company which you handled as chief construction engineer for them, were they built with company forces or were they built by contract?

A. Well, in the main they were built by company forces. The Pit 1 tunnel which I have described was built by contract, and about four of the tunnels on the Mokelumne project were built by the W. A. Bechtel Company and an associate and a part of the Pit No. 3 tunnel was built by Bates & Boreland Company, of Oakland. Do you wish me to go on?

Q. I was going to ask you what your specific duties were in connection with the construction of all of these tunnels, take Pit No. 3, what were your specific duties?

A. I was in charge, in complete charge of the construction of the tunnel, supervising it from the San Francisco office, had charge of the construction. That had to do with all features of the work of the building of the tunnel, making the estimates and carrying through the complete construction of the work.

Q. Did you physically go upon the work frequently?

A. Yes, usually once a week or at least three times a month I would be on the work during the progress of construction.

Q. Did you exercise the duties or function of an engineer on the [1819] job under the contract during the course of construction? A. Yes.

(Testimony of Otto W. Peterson.)

Q. In behalf of the owner? A. Yes.

Q. During the last few years I understand you have been in the employment of the Pacific Gas & Electric Company. During the period since you went back there in the '20s, and continuing down to the present date, have you done work for other than the Pacific Gas & Electric Company?

A. Yes.

Q. Would you relate any of them particularly with relation to tunnel work?

A. I have made estimates on a number of tunnels for contractors. One of those was an estimate for the Owyhee Tunnel, I believe, in Idaho, on the Owyhee Irrigation Project, which involved about four miles of tunnel work, two miles of about 16-foot size and two miles of smaller tunnel of about 8-foot size, largely through volcanic formations.

Q. What year was that, approximately?

A. That was about five or six years ago. I have not the exact years in mind.

Q. What did you do with that? Did you estimate that for the contractor?

A. I made a detailed estimate of the time required to complete the job, the cost, the necessary equipment, and of course, preliminarily to that I obtained such information and reached such conclusions as I considered proper of the type of ground that would be encountered and the physical conditions.

Q. Who did you do that for, what contractor?

(Testimony of Otto W. Peterson.)

A. I did that for McDonald & Kahn, contractors, of San Francisco.

Q. Did you have anything to do with the construction of the Duboce or the Sunset street railroad tunnel here in San Francisco?

A. Yes. This was along about 1926 or 1927; I was associated with the Utah Construction Company of San Francisco, and in the preparation of estimates and in the construction of the Sunset Tunnel in this city; we of course had to prepare estimates of the work, determine [1820] the method by which the tunnel would be built, and I followed through as a consultant with that company during the construction of the tunnel, until its completion, and until some claims which were incurred were settled and the entire work finished.

Q. What were the approximate dimensions in length and size of that tunnel?

A. That tunnel was about 25 feet wide, 20 feet high, being a double track railroad tunnel about 4,260 feet long, full diameter, and fully concrete lined.

Q. As I understand your remarks, you made the pre-bid estimate for the successful bidder, which was the Utah Construction Company?

A. I won't say I made it for them, I made a bid; others were associated with the firm, who also checked on the bid that we arrived at.

Q. You helped estimate? A. Yes.

(Testimony of Otto W. Peterson.)

Q. And then after the bids were in they got the job?

A. Yes, and built the tunnel.

Q. What function did you perform with them after they received the award of the job?

A. I acted as an associate in the firm, a consultant in all of the work, construction, physically visited that work, usually several times a week. The other work involving tunnels was an estimate for the Boulder Dam canals. I spent about one month's time, made several trips to Boulder Dam before work started, to arrive at a determination of the conditions under which that project would be built, the method which should be followed, and worked on estimates for the building of the dam, and particularly of the excavation work for the dam, and the diversion tunnel. That work was done for the contractor, but was not low, he was next to the low bidder.

Q. In other words, the estimate that was made on that was not the estimate on which the final bid was awarded?

A. No.

Q. During the same period that you have just mentioned did you have [1821] anything to do with the Wawona Tunnel?

A. Yes, I made estimates for the contractor on the Wawona Tunnel in Yosemite National Park, a highway tunnel about, I should judge, $\frac{3}{4}$ of a mile in length, about 20 feet wide, and for the Newcastle Tunnel, another highway tunnel about 25 or 30 feet wide and about 20 feet high.

(Testimony of Otto W. Peterson.)

Q. Where is that located?

A. The Newcastle Tunnel is located in Placer County adjacent to the town of Newcastle; it is about 1000 feet in length, of the dimensions given, largely timbered, and also was estimated for a contractor who was not the low bidder.

Q. How about the Hetch Hetchy tunnels?

A. I made estimates for the completion of a portion of the Foothill Division of the Hetch Hetchy System, which the City of San Francisco had built by contract, that involved several miles of tunnel in the main hard rock tunnel, I believe about 12 by 14 in size. I made estimates for the work of completing the Hetch Hetchy Tunnel through the Livermore Hills, and that involved several miles of tunnel of about 12 feet, 10 to 12 feet in size in very heavy, difficult ground. The city later decided to complete that work, itself. I also made estimates for a number of tunnels on the Metropolitan Water District for at least two groups of contractors, three groups of contractors, in fact, that is, various bids were made for various contractors; altogether I estimated about ten of these contracts that came up on that work, the largest of the project or tunnels being the San Jacinto Tunnel, 13 miles in length, driven in the main from two shafts and also the sinking of two shafts from those two shafts, and from the westerly portal, the size of that tunnel being about 16 feet inside of the concrete lining. The contracting group for

(Testimony of Otto W. Peterson.)

whom I made that particular estimate proved to be the low bidder, but subsequently the district, in working out a supplementary contract, required conditions which they did not desire to meet, so they did not go through with the construction. [1822]

Q. So you had nothing to do with the construction?

A. I had nothing to do with the actual construction of the work, although I visited the tunnel during the period of its construction, as well as other tunnels in the Metropolitan District. I also made an estimate on the Yerba Buena Island tunnel connected with the San Francisco Oakland Bay Bridge.

Q. The same as Goat Island tunnel?

A. Commonly called the Goat Island Tunnel. I believe that in the main covers the tunnels. There were probably four or five others that I have not mentioned.

Q. Did you have anything to do with any tunnels in connection with San Gabriel No. 1 dam?

A. Yes, there were tunnels connected with San Gabriel No. 1 and 2 dams, those dams being built for the Los Angeles flood control district, also dams built for the City of San Diego involving diversion tunnels. Those tunnels were generally 1000 to a quarter of a mile in length and were about 20 to 30 feet in size. I did not actively participate in the construction work which was carried on subsequently. In connection with and along the same lines I advised the contractor on San Gabriel No. 1 dam, a

(Testimony of Otto W. Peterson.)

large structure, on methods to be followed by him in quarrying and shooting operations in the production of rock for the building of San Gabriel No. 1 dam.

Q. Have you ever been called in to umpire or to arbitrate engineering controversies?

Mr. Wittschen: I object to that as immaterial.

Mr. Smith: I just want to show he has also exercised that function.

The Court: Do you know of anybody that has covered the territory that you have?

A. I guess there are others, I imagine there are others.

Q. I did not ask for your imagination. I asked if you knew of [1823] anybody.

A. I don't know of anybody who has covered as wide a geographical area.

The Court: We will take an adjournment now until tomorrow morning at ten o'clock.

(An adjournment was here taken until tomorrow, Thursday, May 26, 1938, at ten o'clock a.m.)

[1824]

(Testimony of Otto W. Peterson.)

Thursday, May 26, 1938;

10 o'Clock A. M.

OTTO W. PETERSON,

recalled.

Direct Examination (continued)

Mr. Smith: Q. You have been present in the court during much of this trial, haven't you, Mr. Peterson? A. Yes.

Q. And you have heard about the Broadway Tunnels that have been discussed here?

A. Yes, sir.

Q. You have heard or read the testimony of all the witnesses? A. Yes, sir.

Q. When did you first hear of the Broadway Tunnels, Mr. Peterson?

A. In the spring of 1934.

Q. Did you visit the site of the Broadway Tunnels at that time, and thereafter?

A. My first visit was in the summer of 1934.

Q. Was construction work in progress at that time? A. Yes, sir.

Q. Upon how many occasions did you visit the Broadway Tunnels after that first visit, approximately? A. About fifty times.

Q. Did those visits occur more or less frequently, commencing with the summer of 1934?

A. Yes, sir.

Q. Referring to the times when you first went over there, will you state, in general, what you ob-

(Testimony of Otto W. Peterson.)

served of the operations of the Contractor upon those visits in the summer of 1934?

A. Starting with my first visit?

Q. Yes, commencing with your first visit, just briefly describe the work that was being done by the Contractor and the problems he was dealing with.

A. My first visit was made July 21st. I happen to remember the first date. That was July 21, 1934.

Q. Have you made a memorandum, as nearly as you can from your records, of the dates when you visited there?

A. Yes, I made a [1825] brief summary of those dates. The first visit was July 21, 1934, at which time the Contractor was excavating the open cut at the west portal. At that time, the Contractor was having difficulty with the overbreak on the slopes of the cut, and he wished my advice on what he should do in the way of further removal of the material, or just at what point I thought he should discontinue that sloping, or excavation on the slopes; and this was being done with a power shovel and the material—they were endeavoring to hold the material on the slope of one-half foot vertical to one horizontal,—what we call a “half to one slope”; and it was very apparent that that slope was too steep and that it was necessary to excavate back to approximately one to one slope, to make the banks safe for the workmen below and for the equipment working in the area below those banks.

(Testimony of Otto W. Peterson.)

I observed the conditions. The open cut excavation had been substantially completed at that time. I next visited the site of the west portal on the 5th of August, 1934. They had done considerable sloping in the intervening three weeks—two to three weeks; but the banks were still unstable in places, and they were still excavating to make the banks safer; and I recall that. These visits, other than the first visit, were purely personal; in fact, the first one was a personal visit. I was asked by one of the contracting firms to go up with him and take a look at the portal at the time of the first visit.

Q. How long did you stay on that occasion?

A. I was there probably two hours.

Q. It was all outside work that was in progress?

A. All outside work at that time. I again went up to the tunnel on August 11th or 12th.

Q. 1934?

A. 1934. I might refer to this list of dates here [1826] if I may be permitted to do that.

Mr. Smith: I presume there is no objection to him referring to that list of dates.

The Witness: A. I went up again on September 2nd. I frequently went up there on Sunday mornings or on Saturdays, to make these personal visits; and, at that time, it is my recollection they had discontinued entirely the excavation of the slopes and had started the first drift work into the south tunnel.

(Testimony of Otto W. Peterson.)

I visited there with Mr. Larson some time. He was superintendent in charge of the tunnel work. I then went over to the office, and looked over the plans,—some of the plans,—to get a general idea of the project, with Mr. Fontaine, the manager, and Mr. Orselli, the engineer for the Contractor, who had formerly worked for me. That was about the first time that I looked over the plans for this tunnel in any detail, although I knew, in a general way, what they proposed to do.

Q. Did you examine the specifications at the same time?

A. No— Well, just in a preliminary way; just got a general idea at that time what the nature of the plan was, and the nature of the job, so far as I could observe.

I again visited the tunnel on October 14th,—which was Sunday,—with Mr. Sedgewick, a geologist from Southern California, who happened to be visiting with me at the time; and, on that visit, I recall that the drifts had advanced probably 40 feet or so into the south bore particularly, and that they were in very heavy ground. They had done some concrete work in the meantime for the west portal structure, and were bracing the portals of this tunnel against that structure. They were also finding it necessary to use some intermediate sets and braces in the drifts, to hold the ground; and, [1827] generally, it was heavy, difficult ground to hold.

(Testimony of Otto W. Peterson.)

On that visit, we went into the drifts; looked them over quite thoroughly and looked over the ground at the portal, and rode around the area surrounding the tunnel.

Q. Did you observe the Contractor's methods and workmanship on that visit? A. Yes.

Q. And upon your preceding visits?

A. Yes, on all of these visits I did that. I also visited with Mr. Larson, whom I had known for some years, and was very much interested in his problems and in discussing his problems with him.

The next visit I made was on December 23, 1934. It was something over two months later. At that time, they had completed the excavation of these circumferential drifts, and had concreted about 95 feet of both tunnels, and were waiting for the time for the concrete to set,—the time they would be permitted to remove the forms before they could advance further the tunnel driving.

Q. The forward excavation was not in progress at that time?

A. No; the forward excavation was not in progress. I think, in fact, on that particular visit, Mr. Larson was away for a short time.

On January 19, 1935, about a month later, I visited the tunnel and spent a good part of the forenoon there visiting with Mr. Larson, who was then in charge of the north tunnel, and Mr. Whitmire, who was in charge of the south tunnel; and, at that time, they were advancing the drifts, driving two

(Testimony of Otto W. Peterson.)

bottom drifts forward on each side of the south tunnel; and Mr. Larson was following the wall plate system. Whitmire had two bottom drifts, as I recall, on the south tunnel, and top heading; and Larson was using the wall plate and top heading method. They had gone about some 90 feet [1828] further, I think, ahead of the concrete lining.

Q. That is, ahead of what has been testified to here as the west portal section?

A. Yes. The ground in the south tunnel was heavy and broken. In the north tunnel, it was drier, but not good supporting ground. They were using heavy timbers in both the tunnels.

My next visit was on March 24th, about two months later, on a Sunday morning. They had carried the excavation possibly another 100 feet or so further. I do not remember the exact amount. They were in some better ground, although the conditions were still difficult,—quite difficult,—in the south tunnel; and it was moderately difficult in the north tunnel.

Q. Did you observe the timbering work that was being done by the Contractor?

A. Yes. I observed the timbering at that time. I believe it was about at that time that I had a discussion or a talk with Mr. Price. He wanted to know what advice I might offer him, and I cautioned him particularly—

Mr. Wittschen: I don't think conversations between the witness and Mr. Price are admissible.

(Testimony of Otto W. Peterson.)

Mr. Smith: No.

Q. Just confine it to your observations.

A. I observed the timber work being done. They were timbering in what would be considered heavy ground, and were using heavy timber supports to hold it.

My next visit was, I believe, on April 24th, or May 24th—I have so many dates here—

Mr. Smith: What was the date of the last visit the witness mentioned, Mr. Reporter?

(Record read.)

A. On April 14th, I again visited the tunnel on a Sunday morning, [1829] and went over the work with Mr. Larson and Mr. Whitmire, in a personal way.

Q. Had you known Mr. Whitmire before?

A. Yes; I had known Mr. Whitmire for a number of years. He was, at one time, superintendent for the San Joaquin Light and Power Company on one of their tunnel projects, and for a number of years was the tunnel superintendent for the Southern California Company on an extensive program of tunnel work in Big Creek on the headwaters of the San Joaquin River, and also on a tunnel for the Utah Construction Company; possibly Bechtel was associated in the job; it was on the summit of the Sierras. On that visit, Whitmire was in ground that required breastboarding on the south drift, particularly heavy ground; and I don't believe there was any breastboarding elsewhere, but the other

(Testimony of Otto W. Peterson.)

drifts generally were in rather heavy ground. It was all timbered tunnel.

The next visit was several months later, on August 5th.

Mr. Tinning: Q. Mr. Peterson, a few moments ago I thought you said May 24th?

A. No; April 14th and then August 5th.

I visited the tunnel late in the afternoon and in the evening with Mr. S. D. Bechtel and Mr. Phillips. I accompanied them and looked over all the headings of the tunnels quite thoroughly; and, at that time, I observed they had passed through some ground that was very difficult, and some portions that were more favorable, all timbered, and were in the vicinity, or had just passed the first cross adit, and were in quite heavy ground in the forward end of the tunnel; in fact, the driving at that time was in heavier ground than in some of that which they had passed through, considerably heavier ground than that which intervened.

Mr. Smith: Q. That was just east of the first cross adit? A. Yes. [1830]

Q. Or about at that location?

A. Yes. I again made a visit to the tunnel on Sunday, August 11th, in the afternoon, with Mr. S. D. Bechtel and Edgar Kaiser. All of these were personal visits. I observed the conditions at the headings and in the tunnels generally, and the ground was becoming quite heavy and quite difficult in the forward end of the tunnel; and, at that

(Testimony of Otto W. Peterson.)

time, they were also concreting, particularly concreting the footings in the sides of the tunnels; were excavating the footing trench and some of the concrete work of the arch was in progress. They had their steel forms in, and, I believe, had done some concrete work, had got it under way some weeks previously.

The next visit was on the night of August 28th, the night of the cave-in, in the north tunnel. I was asked then to go and observe the conditions and see what I might offer in regard to the problem that the Contractor had to deal with. I spent several hours looking over the site of the cave-in, both from the exposure toward the west portal, and also by going around through the cross adit and observing the conditions at the east portal. I also looked over the headings of the two tunnels, generally; and attended a safety meeting which Mr. Fry, secretary of the California Industrial Accident Commission, asked me to attend; and I was asked by Mr. —

Q. I think rather than secretary he was in charge of safety?

A. He was the manager, I assume. He is in charge of safety work for the Commission; that is, whether he is the manager or the superintendent, I don't know just what his exact title is. I returned to the tunnel the following morning, August 29th, and went in and observed conditions again, to attend another safety meeting, and spent the entire forenoon there. I believe that it was in the after-

(Testimony of Otto W. Peterson.)

noon of that day that I was asked to go to the office— Shall I stay right with the visits to the tunnels, or shall I state what occurred?

Q. No; state what you did.

A. That afternoon, I was asked to go with members of the Six Companies and their engineers to the Highway District office for a meeting, which I did; and, at that meeting, I—

Q. Who was present at the meeting?

A. There were quite a number who were present. There was Mr. Kaiser and Mr. Bechtel, Mr. Barlow of the Utah Construction Company, Mr. Hackley, Mr. Tibbitts, Mr. Phillips, Mr. Price, Mr. S. D. Bechtel, and there we met Mr. Boggs, Mr. Lippincott,—who had just come up from Los Angeles, as an engineer for the District,—and Mr. D. W. Albert, who had been retained by the District; Mr. Barclay, the assistant to Mr. Boggs; I believe that is about all who were present. There were quite a number there.

Q. What was the nature of the conference, engineering or—

A. Yes, it was essentially an engineering conference to try to reach some decision as to what should be done to meet with the conditions that had been encountered in the tunnels, and particularly in the south tunnel in the area of the cave-in, and with the problems generally in the materials that had been encountered.

(Testimony of Otto W. Peterson.)

Mr. Alexander: Q. Would you give me the date of that meeting, again?

A. The date of that meeting was the 29th of August.

Mr. Wittschen: I think he said the south tunnel; he meant the north tunnel.

The Witness: The cave-in was in the north tunnel,—I beg your pardon,—and about 250 feet, as has been stated, from the west portal. The outcome of the meeting was that it was suggested there should be engineering representation on the part of the District and by the Contractor to see what could be done to get at the problems; and Mr. Lippincott made the suggestion— [1832]

Mr. Wittschen: Just a moment. He was not asked for any conversations.

Mr. Smith: Not yet. No.

Q. What did Mr. Boggs say at that time, if anything, about—

Mr. Wittschen: Objected to as immaterial and not proving any issue in the case.

The Court: I will allow it.

Mr. Wittschen: Exception.

The Witness: A. Mr. Lippincott, did you say?

Mr. Smith: Q. No; Mr. Boggs.

A. Mr. Boggs, I think, stated that the plan that had been proposed by one of the consultants of the District was acceptable to him, and that we should proceed in accordance with that plan.

Q. What was that plan?

(Testimony of Otto W. Peterson.)

A. That plan was one suggested by Mr. Lippincott, that he and a party that he might wish to take with him and myself, representing the Contractor, should go up to the tunnels, look over conditions on the ground, and decide what was best to do in dealing with the problem at that place; and that was agreed to by Mr. Bechtel and Mr. Kaiser, representing the Six Companies, and Mr. Boggs, representing the District; so we went out.

Q. Who went out?

A. Mr. Lippincott, Mr. Albert, Mr. Barclay, Mr. Bogg's assistant and myself, went to the tunnel and went through the various points of work and observed again the status of the work, to proceed with the problem of deciding what was the proper thing to do.

Q. Was anything decided on between the District representatives and yourself?

A. Nothing—

Mr. Wittschen: Just a moment. I want to interpose an objection.

The Court: There was nothing done.

Mr. Wittschen: There was nothing done; so there is no objection. [1833]

The Witness: That was the main purpose: to get the facts as nearly as we could; to determine the physical conditions, which we did; exchange views and make observations. That was the main thing accomplished on that date. There were considerable conversations.

(Testimony of Otto W. Peterson.)

Mr. Wittschen: I think the question has been answered.

Mr. Smith: Q. Just recite what next occurred, —what you next did; what you observed at the tunnel, or in connection with what you started out to do.

A. Well, we observed——

Mr. Wittschen: Pardon me. If you are calling for a conversation, will you ask for it so I may interpose an objection?

Mr. Smith: Yes. I asked him what was done.

The Witness: We observed that the timbers—— We observed there was a considerable amount of footing trench open that they were actively engaged——

The Court: Q. You say “we”?

A. I observed; pardon me. I believe “we” is correct; but I observed there was considerable footing trench opened,—about 900 feet; and they were actively proceeding with the concreting of that trench; that the timbers had moved into the concrete section in a considerable portion of the tunnel, particularly in the heavy ground,—moved somewhat in and downward; and we observed the places where the ground was heaviest and where the timbers, the timber movement, was the heaviest; and it was my observation that the timbers adjacent to the west portal just forward of the concrete that had been poured had moved in just subsequent to the time that that portion of the tunnel,—the two

(Testimony of Otto W. Peterson.)

bores,—had been driven, and had remained substantially stationary since that time; that the timber forward of that was generally clear of the neat concrete section except for two local areas in the north tunnel; the greatest difficulties being encountered were in the vicinity of the [1834] first cross adit and forward of that where they were in the so-called cherts formation.

Q. In your observations about the timber movement just east of the installed concrete, you made that observation on earlier visits, I take it.

A. Yes. I had looked over that rather critically, and I had been observing that from the time of my first visit. [1835]

Q. What day was that?

A. That was August 31. I remained home the entire morning.

Q. This was all in 1935?

A. 1935. I remained home that entire morning and looked over the plans and specifications with particular reference to the tunnel construction and the geological report. The afternoon of that same day, about two o'clock, I went to the tunnel, to look over the tunnel again to see how the work was progressing, and I was to see Mr. James Sanborn, an engineer who had been called out from New York by the Six Companies, to act as a consultant, to go over the job, and I spent a good part of the afternoon in going over, going over thoroughly again with Mr. Sanborn the job, and again observed

(Testimony of Otto W. Peterson.)

the tunnel conditions. On the next day, Sunday, September 1, I again went over the tunnel during the forenoon with Mr. Sanborn, looking at the timbering and ground conditions, and I observed on that visit a group of the district engineers, Mr. Lippincott, Mr. Van Norman, also an old friend of mine, Mr. Boggs, and Professor Derleth, who were consultants for the District, retained by Mr. Boggs, and at 3:20 we looked over conditions together to some extent, that is, I did with the consultants of the District, and in the afternoon of that same day I went to the home of Mr. Derleth and there consulted further with the District's consultants, Mr. Lippincott and Mr. Van Norman and Professor Derleth—Mr. Boggs was also present—on the problem of what should be done to concrete those portions of the tunnel that were then excavated and unlined. I might state that on or about, at the time of my visit on August 28th, all excavation of the tunnel had been stopped and that only concrete work and timbering work was then in progress.

Mr. Wittschen: You asked him what he had seen in the tunnel and that is what he was answering.

Mr. Smith: No, I asked him what he did. [1836]

A. On August 30, on the afternoon of August 30, following up this conversation with the consultants of the District, I went to the Hotel Oakland and there consulted with Mr. Lippincott, and

(Testimony of Otto W. Peterson.)

I believe it was there—it might have been at Professor Derleth's house—there are so many visits—I started in the discussion as to what we might do in making plans with a view of working out a plan initially of permitting the timber to encroach into the concrete section with a view of minimizing the amount of timber removal that might be done, and accomplish the concreting of the tunnel; this same subject was followed up at the time of this visit on September 2nd with the consultants of the District. It was realized—it was my conclusion—

Mr. Tinning: Just a moment, we object to that.

A. I will be glad to get this in in the proper manner.

Mr. Wittschen: The Court will determine what is proper.

The Court: I think the witness is doing the best he can. However, his conclusion at this time may go out.

A. While we were working—

Mr. Wittschen: I submit there is no question pending before the witness.

Mr. Smith: He had been at Dean Derleth's house and he has told us of the meeting at the hotel.

The Court: Proceed.

Mr. Smith: Q. What was the conclusion, in sum and substance, that was reached at the meeting that you had with Mr. Boggs and the consultants of the District at Dean Derleth's house?

(Testimony of Otto W. Peterson.)

Mr. Wittschen: Objected to as immaterial, that matter has already been concluded by the letters which are in evidence to the effect that the section would be dropped 10 inches without cost to the District. [1837]

The Court: Was that the result reached?

A. The preliminary steps finally led up to that arrangement.

Q. All right, proceed from there on.

Mr. Smith: The only thing about that is, the testimony would show in answer to that question that these engineers agreed that this was the thing to do, including the engineer for the District, Mr. Boggs, as early as this date, which was September—was it the 1st or 2nd? A. September 2nd.

Mr. Smith: Mr. Boggs concurred and the District never permitted it to be done until September 28th, and did not give formal approval to it until November, thereby delaying the contractor in the starting ahead of the doing of the thing that they did finally authorize on their own application to be done.

Mr. Wittschen: The letter is in evidence that the District gave this formal approval at the start of it. It is also in evidence without contradiction that they went right ahead and dropped the section and where the delay occurred was in order to get the P.W.A. approval, but pending that approval the contractor did not stop, and that approval came—

(Testimony of Otto W. Peterson.)

Mr. Smith: The fact is the evidence does not show what counsel says. There was never any permission given under which the contractor, by oral permission or otherwise, sought to lower or did lower the arch or change the design of the concrete section until after the last week in September.

Mr. Tinning: On September 24th.

Mr. Smith: In other words, there was no work done until after September 24, so there would be a delay between this date when the District should have authorized it and September 24.

The Court: You are assuming a fact not in evidence, namely, that the District authorized it. The Government was the one. [1838]

Mr. Smith: The Government was not a party to the contract. There is nothing said in the contract about the authority of the P.W.A. to approve or disapprove any design of the structure.

The Court: All right, let us clear that up. What was the purpose of getting that approval?

Mr. Wittschen: The P.W.A. had put a million dollars into the work, they approved the plans and specifications, and your Honor will recall that all through this, even Mr. Bechtel, when he testified, stated it was necessary to get their approval for working conditions, it was necessary to get their approval, and one of the witnesses has testified that they had inspectors on the job, who followed the job. This lowering of the tunnel about ten inches was a material change in the plans. The testimony

(Testimony of Otto W. Peterson.)

is in that the P.W.A. approval would have to be forthcoming, the Industrial Accident Commission approval had to be forthcoming, because they ordered all work stopped; so when the Industrial Accident Commission approved the change, whatever the date was, I think it was September 4, they went right ahead, they did not wait until the formal approval came from the Government; as soon as the formal approval came from the Government, or sometime thereafter, Boggs gave them formal approval, but in the meantime just as soon as the Industrial Accident Commission permitted it they went right ahead and were not delayed.

The Court: All of which this witness knows very little about. Let us get through with this witness.

Mr. Smith: May it please the Court, I want to state that the testimony would show if the question be permitted that Mr. Boggs stated that it was the proper thing to do at this particular time.

The Court: Proceed.

A. I again visited the tunnel on September 4th, on which date I had been given formal authority by the Six Companies to handle all [1839] matters with the District, any problem that might come up affecting engineering and the procedure to be followed at the tunnel in carrying forward the tunnel work.

The Court: September 4, 1935? A. Yes.

(Testimony of Otto W. Peterson.)

Mr. Smith: Q. Was your authority so given communicated to Mr. Boggs by you?

A/ Yes, communicated to Mr. Boggs, and to both consultants, whom I contacted. On September 5 I again visited the tunnel and decided that the situation was sufficiently serious so that we should proceed more energetically with the concrete lining. We were without a plan under which we could deal with these areas in which the timber had encroached into the tunnel, and in order to proceed we had to make a decision, and since the decision was not forthcoming from the District I took the initiative and told Mr. Boggs that we were going to proceed with the building of the tunnel of the same size at a slightly lower grade, with the arch of the tunnel lower six inches, that we had to have some plan to proceed with, and we would take our chances and go ahead and proceed with this plan, and I told him that we would start to change our forms and pour.

Mr. Smith: Q. You mean by "forms" the steel forms?

A. Yes, the steel forms, because the work was not going ahead with enough force and enough speed to get the work done as rapidly as it could be done if we had some definite plan to work to. And I called upon Mr. Boggs to let him know what I proposed to do, and he said that he did not approve of that plan. So, shortly after, I called him up again and asked him if he disapproved of the plan and he said that he did disapprove of it very much, and

(Testimony of Otto W. Peterson.)

furthermore was sending out a *désist* letter, which was received that evening, and in the face of that notice we discontinued all work in that portion of the tunnel where the trimming of the timbers was so great [1840] as to be hazardous, or the moving of the timbers was too serious to be warranted, and confined our operations only to those portions which could be concreted without serious menace to the workmen and to the structure. On the 6th of September Mr. Boggs called me about 5 o'clock p.m. and said he would like to see me. I called at his office the following morning, September 7th, and had a discussion with him, which lasted from 9 o'clock in the morning until sometime after noon, after 12 o'clock noon.

The Court: Q. Did you go to lunch together?

A. I think we went to lunch together, yes, very good friends. There were present at the meeting Mr. Boggs, I think Mr. Earl, another consultant whom I had known for many years.

Mr. Smith: Q. A consultant for whom?

A. A consultant for the District.

Q. When you say "consultant" you mean consulting engineer?

A. Consulting engineer, yes; Mr. Sweetser, an engineer of the Bureau of Public Roads, representing the P.W.A., I believe it was, Mr. Barclay, Mr. Boggs' assistant, and I believe that was about all. I believe before the others came into the room

(Testimony of Otto W. Peterson.)

either on that day or the next day Mr. Boggs talked to me about the problem of the tunnel and made the statement that he was sorry that I did not go ahead with the concreting, that he thought I would ignore the letter and go ahead.

Mr. Wittschen: The witness is not answering the question.

Mr. Smith: The witness apparently is giving his best recollection. He is trying to tell what happened.

Mr. Wittschen: But I would like to have him asked a question. He was not asked anything like this.

Mr. Smith: Q. Proceed and state what you next did. Had you concluded the discussion at that meeting that you had testified to with Mr. Boggs? [1841]

A. We had quite a full discussion—

Q. This is the same meeting?

A. Yes, of September 7.

Q. Was Mr. Boggs present all the time?

A. Yes, he was present; there was quite a full discussion of the conditions of the tunnel and of the things that we could or should do to get the bores fully lined, and Mr. Boggs expressed—I will keep away from that.

Q. What was said?

A. Mr. Boggs expressed a fully cooperative attitude to allow for—he said that he would consider the encroachment, moderate encroachment of the timbers into the tunnel, provided the plan proved feasible on full check and investigation, and we

(Testimony of Otto W. Peterson.)

realized at that time that we had—

Mr. Wittschen: Just a minute. State what was said.

Mr. Smith: Counsel wants you to limit yourself to the sum and substance of what was said by you and Mr. Boggs.

The Court: What you realized, would be a conclusion.

A. I stated that, the conclusion reached by Mr. Boggs and myself—

Mr. Wittschen: What you said and what he said.

Mr. Smith: Q. State the sum and substance.

A. I said we needed to move up with more decision—we seemed to know—we knew what should be done, or approximately what should be done, and it seemed possible to arrive at a decision, but in this case contrary to most others it was difficult, apparently, unusually difficult for Mr. Boggs—Mr. Boggs stated that this was a problem on which he could not proceed directly with an independent decision on the modifications that were necessary for the lining of these tunnels, to meet the conditions which had been encountered.

The Court: Would that change the contract?

A. Not necessarily, this particular thing, so far as the actual concrete lining was concerned; we were trying to work out a method to build the lining, itself, so far the lining itself, was concerned, at a little [1842] different grade from the theoretical position.

(Testimony of Otto W. Peterson.)

Q. Undoubtedly you had in mind the plans and specifications? A. Yes.

Q. That was a departure from them, was it?

A. It was a departure from the plans and specifications strictly and technically.

Q. Possibly Mr. Tinning was making the decision.

A. That became more evident as we proceeded; he was in fact the man who made the decision.

Mr. Wittschen: I ask that that go out.

The Court: That may go out.

A. It was very evident that we needed somebody who could make a decision.

Mr. Wittschen: I ask that that go out and I ask that the witness answer the question.

The Court: Under our court procedure we have the same difficulty that you get into in the engineering field. Under the rule they are entitled to proceed under question and answer so that they may make their objection, and let us try to conform to that rule.

Mr. Smith: Q. Have you concluded your statement of what was said at that particular conversation between you and Mr. Boggs, in sum and substance? If not, give the balance of what was said by you or by him?

A. Mr. Boggs said that he would not consider any plan of arbitration, at least at this time.

Q. Is that all on that day?

(Testimony of Otto W. Peterson.)

A. That was the progress accomplished; nothing was done in the way of a decision.

Mr. Wittschen: The question has been answered. Was that all the conversation?

A. That was not all the conversation.

Q. That is what he asked you.

Mr. Smith: Q. If you have anything more to add to it please add to it, tell us the sum and substance of it.

A. Between Mr. Boggs and myself the sum and substance of the thing [1843] was that Mr. Boggs said that he would continue to study the problem; I had proposed to him a plan of lowering the arch six inches and bringing in the sides of the tunnel—of lowering the arch, of lowering the entire tunnel lining six inches, still giving adequate roadway space and get the tunnel built, and that was the tentative thing under consideration at that time. Mr. Boggs said that he was not going to, that he did not accept that recommendation, but would take it under consideration and give it further thought. On September 9—

Mr. Wittschen: Pardon me, that question has been answered. Now he is going to another conversation.

Mr. Smith: I submit the witness is trying to be fair.

Q. Had you finished that day? A. Yes.

Q. When was the next occasion that you visited the tunnel or had a meeting with Mr. Boggs and his consultants or assistant engineers?

(Testimony of Otto W. Peterson.)

A. Two days after that I again—

Q. That would be what date?

A. September 9, 1935, at 9 a.m. I went to Mr. Boggs' office and there, in the presence of Mr. Sweetser, Mr. Earl and Mr. Barclay, we further discussed the matter of a plan for the concreting of these tunnels. No conclusion was reached.

Q. So there was nothing of any importance?

A. Nothing of any particular importance except a great amount of conversation.

Q. Did you go to the tunnels that day?

A. Not that day.

Q. What did you next do by way of activities on the same subject?

A. On the next day, September 10, I went to the tunnel at 7 o'clock in the morning and there had a drawing made showing the tunnel sections with the roof line lowered 10 inches, which was the proposed modification, which I took to Mr. Boggs' office in the same forenoon together with a memorandum which I had written, making a definite proposal for that change in the portions of the tunnel [1844] which could only—making the proposal that that sketch be used in those portions of the tunnel where the timber had encroached into the theoretical concrete lining to such an extent that it was hazardous to hew the timbers sufficiently or to reset the timbers with safety to the workmen, and presented that as a definite proposal to Mr. Boggs.

Q. What did he say?

(Testimony of Otto W. Peterson.)

A. I asked Mr. Boggs if he would not agree to that proposal. I said that the contractor would do the particular work involved in the placing of this concrete section, together with the immediate additional concrete that would be required between this theoretical section and the timber, so far as that particular work was concerned we would do that at the same cost that the theoretical section called for in the plans, or at the same price, or without extra cost, as a substitute for the theoretical section called for in the plans. This, however, did not involve any question as to the claims or charges or costs for the excavation and timbering necessary for building either the theoretical section or this modified section in these particular situations where the modified plan would be used, and I urged Mr. Boggs to agree that we should proceed with this plan, and Mr. Boggs read what I had written, and in the main agreed with the proposal; he suggested that we should also include in this a statement that the Six Companies would modify the hanger rods and make some adjustment in the ventilating chamber which were within the theoretical section of this concrete lining, and I said that I anticipated including this work also and that that as well would be done as a substitute for the theoretical section shown in the plans.

Q. By "theoretical section" you mean the designed section?

A. The designed section.

(Testimony of Otto W. Peterson.)

Q. At the exact location shown?

A. At the exact location shown [1845] in the plans.

Q. Does that conclude your meeting of that day, or have you anything to add to that?

A. Mr. Boggs stated that he was not prepared to give me an answer, that while the plan appeared to have good merit and in general was in accord with his views, he would first find it necessary to consult with the officials of the District, and with the P.W.A., and Bureau of Roads, State Highway District of California, and he agreed that he would proceed immediately to do that. [1846]

(After Recess)

Mr. Smith: Q. Had you concluded? I have forgotten exactly where we were. Had you concluded the meeting on September 10th that you were discussing?

A. No, sir.

Q. Was anything further said or exchanged between you and Mr. Boggs at that meeting?

A. In urging on Mr. Boggs that we reach a decision along the lines of this modification, I told him what had been done by Mr. O'Shaughnessy in the building of the Sunset Tunnel in San Francisco, where the contractor went through 300 feet of heavy ground some little distance in from the east portal. We went through this particular area of heavy ground without any unusual occurrences, and shortly after we had gone through the ground, the tun-

(Testimony of Otto W. Peterson.)

nel at that place, the timbers at that place settled a total of 20 inches; the timbers had been placed above grade, but there was a very decided movement, and it was entirely impracticable and unsafe to attempt to reexcavate that tunnel at that place and reset the timbers.

We conferred with Mr. Bartel, who was Mr. O'Shaughnessy's representative on the job, and Mr. Callahan, in Mr. O'Shaughnessy's office.

Mr. Wittschen: Q. Will you tell us what you told Mr. Boggs?

A. I told Mr. Boggs that we consulted with Mr. Bartel and Mr. Callahan, and, inside of about two days' time, we had authorization from Mr. O'Shaughnessy to lower the grade of the tunnel about 10 inches; a slight change was made in the roadbed and a slight change in the railroad grade; that we were immediately at work putting in bracing and concrete rings and proceeded with the concreting of this difficult section; I told Mr. Boggs that I thought that this was, along with other experiences where similar things had been done in tunnels in the way of changing grades as long as the structural strength was retained, a thing which chief engineers frequently have to do, and I thought that he should act on his own responsibility and [1847] give us authority to go ahead. Mr. Boggs said that he thought this precedent would be very helpful to him and he would be very glad to have me give him a full statement of it; which I did, in a letter dated

(Testimony of Otto W. Peterson.)

two days later, giving him the information from the City's official report on this particular heavy section in the Sunset Tunnel.

Mr. Smith: Q. You are referring to Mr. O'Shaughnessy, the San Francisco City Engineer?

A. Yes, Mr. O'Shaughnessy.

Q. Mr. O'Shaughnessy had the same function on the Sunset Tunnel as Mr. Boggs did on the Broadway?

A. Yes. Mr. O'Shaughnessy was the City Engineer, the engineering official,—the executive; and Mr. Boggs was in a similar situation.

Mr. Tinning: Mr. Smith, I don't want to interrupt your examination, but the City Engineer of San Francisco, under the Charter provisions, is entirely different from a legal situation than a district engineer of this District.

Mr. Wittschen: They had no PWA, either.

Mr. Tinning: They did not have the same functions. They might have the same engineering functions; so I am going to object to the question, and ask that the answer go out, on the ground it does not state the facts.

Mr. Smith: The clauses in the contract of the District for the construction of the Broadway Tunnel and the clauses in a similar contract for the construction of Sunset Tunnel confer similar powers on the Engineer; and I take it that is a matter of legal argument. I was just identifying that it was Mr. O'Shaughnessy of San Francisco.

(Testimony of Otto W. Peterson.)

Mr. Tinning: The only objection, Mr. Smith, that I have is it was an attempt to go beyond his engineering functions. I wanted to make that objection. If it is merely for the purpose you have [1848] stated, I have no objection.

Mr. Smith: No; that was solely for the purpose of identifying who Mr. O'Shaughnessy was.

The Court: Proceed.

The Witness: A. Mr. Boggs agreed that he would proceed at once in an effort to obtain approval for this section; and we parted on that day.

Mr. Smith: Q. That was September 10th. Have you concluded September 10th now?

A. Yes. On September 11th—

Q. Let me ask you a question first: Upon what occasion next did you visit the tunnel; or did you have any meeting with Mr. Boggs; and, if so, what was said, or what did you observe at the tunnel?

A. On September 11th, I had a telephone conversation with Mr. Boggs, in which he reported that he was making progress in his contacts with the Bureau of Roads and the State.

On September 12th, I visited the tunnel; went through the entire workings very carefully, and observed particularly the formations in the easterly part of the bores that were open to observation.

Q. You mean the easterly part of the west bore?

A. Yes, the easterly part of the tunnel timbers, from the west portal. I observed the ground was very seriously heavy near the extreme easterly end

(Testimony of Otto W. Peterson.)

of those tunnels, particularly from the first cross adit to the headings; and I went down to Mr. Bogg's office and again urged on him the approval of this plan which he was proceeding with in a thoroughly cooperative way. I spoke to him also, told him that in some special instances it might be difficult to clear all of the tunnel even to comply with the proposed plan of modification of dropping the roof 10 inches, but we might need some tolerance on the timbers, such as I stated to be customary in the building of tunnels, to allow [1849] some encroachment of individual timbers into the section; and he agreed that he would allow about one inch for the segment timbers encroachment or tolerances, and about two inches for the posts.

Q. Did you speak about it?

A. Yes; that was the conversation; he stated that he was agreeable to tolerances of that order, and he stated that he was making good progress with the modification, and thought that it would meet approval at an early date.

Q. Does that conclude that—

A. That concludes that date, except as to this one point: that I stated in part, I was particularly emphatic about the desire to get the worst places in the tunnel concreted at the earliest possible date; in other words, those places from the first cross adit on to the headings. We wanted to do the timber work which was preliminary to the concrete work, and all the other work, so as to speed that up. We were,

(Testimony of Otto W. Peterson.)

in the meantime, going forward with the regular concrete lining in those sections in which the driving or proposed driving did not apply.

Q. Have you concluded your comments upon that date? A. Yes.

Q. Upon what next date did you see Mr. Boggs or did you visit the tunnels?

A. I again, on September 13th, spent the entire forenoon in the tunnels, going over the details of timber position encroachment and with the formulation of plans under which we would proceed with the excavation upon obtaining approval for this modified section.

Q. Was any excavation going on at the particular time forward in the tunnel on the west end?

A. No; no excavation whatever.

Q. Except at the point of the August 28th cave-in?

A. That is all. Also, on this day, September 13th, I telephoned Mr. Boggs to find out what progress he was making in the matter of approval for the modification.

Q. Does that conclude that date?

A. Yes. [1850]

Q. What was your next experience?

A. The next was September 14th. I went to Mr. Boggs' office at 3:40 a. m., and asked him if he was not at that time ready to agree on the modification, or at least on the language of the modification, so that the proposal would be in form for quick ap-

(Testimony of Otto W. Peterson.)

proval, as long as he was authorized already to act. He stated he needed authorization; and I wished to be sure, and I told him it would be highly desirable to have a definite statement of language; and, on this occasion, or some day near this,—I think it was at this particular meeting,—Mr. Boggs showed me what his ideas of the proper language were, and stated then, as he had stated on one or two previous occasions, that he was in substantial agreement with the language that I had used, the conditions that it covered, and that he would release this; he would let me go over the final draft with him as soon as he had approval from Mr. Tinning as to the form of the statements in this paper.

Q. When he referred to the language being similar to his, or his being similar to yours, he was referring to a paper you left with him a few days before, that you mentioned?

A. Yes, a memorandum.

Q. Proceed, if there is anything further to add on that occasion that you are talking about.

A. On September 15th, the next day, in the morning, I went to the tunnel with Mr. Roy Hackley, a tunnel consultant retained by the Six Companies, to go over the tunnel supports thoroughly, and to determine what procedure we should follow in pressing forward more energetically with this work at the various places. By that time, the ground last excavated from the vicinity of the cross adit to the heading had become so heavy that it was neces-

(Testimony of Otto W. Peterson.)

sary to resort to some supplemental support, and we decided that gunite would be the most desirable supplemental, artificial support to introduce in the tunnel. [1851]

Q. I take it, you mean by "supplemental support" supplemental to the timbers which had been supporting it?

A. Yes. Gunite not only has strength in it but serves to bond timbers together. The gunite proposed was a reinforcing steel gunite. We proceeded with the making of plans for that; told the superintendent to get ready, or to proceed with that work; which was done; and quite considerable areas in the forward part of that tunnel were gunited in the next few weeks. I saw Mr. Boggs at the tunnel either—it was either on this day or the day previous. He said that our plan for the modification of this tunnel seemed to reach an unfavorable stage; that, while he himself was agreeable, there were legal complications that had developed between the attorneys of the two parties and Mr. Tinning; he said he was dejected about the situation, and that a decision was very urgent either to go ahead with the modification or go ahead with the job some way or other, with the modification preferably, or to shut the job down.

Q. Have you concluded your conversation with him on that day?

A. No. At that conversation, he told me something of the nature of what these difficulties were.

(Testimony of Otto W. Peterson.)

The conversation, if you wish me to go into that—

Q. Yes.

A. —that was the sum and substance of it: that—

The Court: Q. The lawyers got together and intervened; was that it? [1852]

Q. What was the occasion of your next visit to the tunnel?

A. On the afternoon of the next day.

Q. What date would that be?

A. September 16, I went to the tunnel with an assistant of mine, Mr. Haberkorn, who was a young construction man with a good technical knowledge as well, and on this visit we looked over the conditions in the tunnel to see what places were available for the placing of gunite, and to have him to make designs for gunite beams which would add to the strength of the tunnel. On the evening of the 16th I telephoned to Mr. Boggs about gunite in particular, and urged upon him the advantages of that type of construction, and of its superiority to concrete in strength, and told him of its uses in many other tunnels, and asked him if it would not be permitted to allow that gunite to project into the concrete sections so as to be most effectively used. Mr. Boggs said that he would consider the matter, but off-hand he questioned the advisability of permitting the gunite to project into the sections, as the steel was permitted, steel supports were permitted to project.

(Testimony of Otto W. Peterson.)

Q. Does that conclude your activities on that day?

A. That concludes that day's activities in substance.

Q. Upon what next occasion did you visit the tunnel or have any meeting with Mr. Boggs about the matter?

A. On September 19th I called at the Hotel Oakland for a meeting with Mr. Lippincott, Dean Derleth, Mr. Boggs and Mr. Barclay, and was there informed by Mr. Lippincott that—

Mr. Wittschen: Just a moment. Was Mr. Boggs present?

A. Mr. Boggs was present. And was there informed by Mr. Lippincott that the reason why the negotiations were not completed was due to the fact that the attorney for the Six Companies refused to do this work, were refusing to do this work in accordance with [1853] the plans which I had proposed; in other words, free from any claim so far as this particular piece of work was concerned, as a substitute for the designed section of concrete. I told Mr. Lippincott and the other persons that I was quite sure that he was mistaken, that I had been discussing the matter with Mr. Max Thelen, who was handling the negotiations, and that it was my understanding that the Six Companies gave full support to my proposal but that the difference had to do with extraneous work or work beyond the immediate confines of this particular concrete

(Testimony of Otto W. Peterson.)

ring as a replacement or substitute for the theoretical ring, and that we maintained our right to make claim for the excavation and the timbering which was necessary prior to the time that we placed this particular concrete, but that so far as the concrete ring, itself, was concerned, it would be built as a substitute for the other, with considerable additional amount of concrete involved without extra charge, that extra concrete being just beyond the exterior limits of this modified section and the exterior limits of the theoretical designed section. I said in my opinion that the tunnel was being built under conditions which were entirely different from those which the contractor depended upon when he took the work, conditions which were different from those which were represented, which he felt he had a right to consider a fair representation, and that I did not feel that the contractor should be asked to waive any of his claims, and Mr. Lippincott stated that he was in agreement with that position, in fact he stated that he understood me thoroughly, and apparently there was some misunderstanding which needed to be cleared up about the matter of claims and what latitude they should take.

Q. Was that the sum and substance of what occurred at the meeting at the Hotel Oakland?

A. Yes.

Q. What happened next?

A. On the next day—

Q. Which would be what date?

(Testimony of Otto W. Peterson.)

A. September 20, I had a tele- [1854] phone conversation with Mr. Boggs and Mr. Lippincott, and I told them——

Mr. Wittschen: Pardon me, just a moment. I do not object to what this witness said to Mr. Boggs, but it is obvious he could not telephone Mr. Boggs and Mr. Lippincott at the same time. If he talked with Mr. Lippincott I object to it as immaterial.

Mr. Smith: You will stipulate that Mr. Lippincott was a consultant for the District?

Mr. Wittschen: Yes, but Mr. Lippincott had no right to change the contract, and Mr. Boggs had no right, either. Will you ask about the conversations separately?

Mr. Smith: Q. What was the conversation with Mr. Boggs?

A. I telephoned to Mr. Boggs and told him that I thought that the situation was a useless one for me to continue in; that I had entered into a thing that I did not wish to enter into initially, and I had entered into it because I thought I could do something constructive, and I felt that I was wasting my time, the recommendation had been made, and when we could arrive at a point that something constructive could be done I would be ready to continue in my position with the contractor, but it was my disposition to tell the Six Companies that I was finished with this particular assignment and wished to be relieved, and he said he thought that the situation looked more hopeful, and urged me to continue on, and, substantially, I telephoned to Mr.

(Testimony of Otto W. Peterson.)

Lippincott, and he said the situation with regard to the consummation of these modifications looked more hopeful, and thought something was going to be worked out.

Q. Does that complete your statement?

A. Yes.

Q. What happened next?

A. I went to the tunnel on the next day, [1855] the 21st, and spent several hours there, and then went down to Mr. Boggs' office with Mr. Hindmarsh, and we discussed details of timber work and concrete work, and clearances, and tolerances of timber and gunite, and about this time I told Mr. Boggs—Mr. Boggs told me, or I told Mr. Boggs, that my study of the gunite proposed would not accomplish all I thought that it would in the way of a design and that I would not press that any further except as a general means of support, but that I did not press it as a full substitute for the concrete lining, but only as a construction support, supplementing the artificial timber support. In the afternoon of that day I went over the work at the east tunnel very carefully with Mr. Hindmarsh.

Q. Did you note the work there and what had been done by the contractor?

A. Yes, I observed the work, the same general ground conditions as those encountered at the west portal, although not quite so heavy.

Q. Requiring timbering support?

A. Requiring timbering support.

(Testimony of Otto W. Peterson.)

Q. What next occurred, Mr. Peterson? When did you next visit the tunnels, or meet with Mr. Boggs?

A. I visited the tunnel next day and went over——

Q. What day would that be?

A. September 2^d and went over the tunnel timbering very thoroughly with Mr. Price, working up data and a graphical diagram showing the position of each of the timbers and laying the basis for the timber survey that was later made of all of the timbers in the tunnel.

Q. Which is in evidence in this case?

A. Which is in evidence in this case.

Q. Does that complete your activities for that day? A. Yes.

Q. Upon what next occasion did you visit the tunnels or see Mr. Boggs?

A. I visited the tunnels on the afternoon of the 23rd [1856] of September, the next day, taking with me Mr. Harry Scott, a tunnel superintendent whom I had obtained from Mr. Hindmarsh, the general superintendent, with a view of having Mr. Scott handle the work of square-setting that was to be done or was in progress and which was to be done to a much greater extent in the portions of the tunnel where the ground was very heavy and where something further than regular timber sets and gunite was required, and where it was clearly evi-

(Testimony of Otto W. Peterson.)

dent that it would be necessary to give this additional support.

Q. Was there any excavation in progress at this time?

A. No, no excavation in progress.

Q. Were they removing the cave-in material then?

A. They were going ahead with the removal of the cave-in, and they were going ahead with all of the concrete work in both tunnels, doing as much as could be done working energetically in the standard sections of the tunnel.

Q. You mean by standard sections where it was not necessary to make any change in the designed section? A. Yes.

Q. What next occurred?

A. On September 24th I attended a hearing of the State Accident Commission at which the question of safe procedure in the Broadway Tunnel was heard, and where it was agreed by the District and the Six Companies that substantially the same recommendation which had previously been made to lower the arc ten inches, with a view of minimizing the disturbance of timber supports should be followed.

The Court: We will take a recess now until two o'clock.

(A recess was here taken until two o'clock p. m.)

[1857]

(Testimony of Otto W. Peterson.)

Afternoon Session

The Court: You may proceed.

OTTO W. PETERSON,

recalled.

Direct Examination (continued)

Mr. Smith: Q. Just before the luncheon recess, Mr. Peterson, you had spoken about events of the 24th of September, 1935, and, I believe, had completed your statement about that date? A. Yes.

Q. What next occurred, as far as your going through the tunnels, or meeting with Mr. Boggs, is concerned, and when?

A. My next visit to the tunnel was on October 1st, at which time all construction activity except driving the bores ahead from the west end was proceeding energetically there, with a large crew of men, especially on the square-setting work, and on the work of preparing the sections in which the lining section of the tunnel was to be placed.

Q. You mean the modified concrete section?

A. Yes, the modified concrete section.

Q. That was October 1st?

A. October 1st, yes.

Q. Have you concluded your remarks about that date? A. Yes.

Q. What next occurred, and on what date?

A. On October 2nd, I made a visit to the tunnel with Mr. Bright and Mr. Sweetser of the Bureau

(Testimony of Otto W. Peterson.)

of Public Roads, and Mr. Barclay of the Highway District also went along. We looked over the work that was in progress in preparing the tunnel for the modified section, and also some additional problems,—special problems,—where it was uncertain as to whether or not we might even have difficulty in moving a few special timbers to meet the requirements of the modified section.

Q. Were they installing the modified section by this time?

A. They were putting up the forms, and I believe they were actually pouring concrete at this time on the first portion of the modified [1858] section, by the use of wood forms. I saw Mr. Boggs at the tunnel, and spoke to him about solving additional difficulties that might arise in which it might be necessary to use a somewhat thinner substitute section than the 24 inches specified in the modified section by introducing structural steel, or by other methods which would give the required strength should that become necessary. Mr. Boggs stated that he would have these thinner sections analyzed and be prepared to make a decision if it became necessary to do so.

Q. Is that all for that date? A. Yes.

Q. What next was the date upon which you went to the tunnels or met with Mr. Boggs?

A. I had a brief visit with Mr. Boggs on the afternoon of October 5th, following a Highway Dis-

(Testimony of Otto W. Peterson.)

trict meeting; spoke to him very briefly about the same subjects that had been discussed on October 2nd.

Q. Did you go to the tunnel on that date?

A. No, sir.

Q. Either at the west or the east portals?

A. It is not my recollection that I did.

Q. Did you go to the tunnels shortly after that?

A. On October 6th, I spent the morning at the tunnels, and again saw Mr. Boggs there; but, at that time, it looked as though we would be able to accomplish all that was required in the modified section that had been accepted except for an interference of possibly two inches; and Mr. Hindmarsh, the superintendent, stated to Mr. Boggs that he thought he could get the full 24 inches, but would do so if it was at all possible to accomplish that result. I might state here I think that was fully accomplished, and that we were simply dealing with contingencies that might arise, and with a view of being prepared to meet them, if they did arise.

Q. Did you observe the work being done by the Contractor in the [1859] tunnels on that date?

A. Yes, sir. I observed the work being done at that date, particularly the work of squaresetting, on which they had quite a large organization and in which I was particularly interested.

Q. What occurred next after October 6th?

A. On October 9th, I went, with Mr. S. D. Bechtel and Mr. Boggs, to Mr. Sweetser's office, where

(Testimony of Otto W. Peterson.)

the language to be used with regard to the description of what would be done or what would be included in the modified section, the design of the modified section, was further reviewed and passed on.

Q. Where was that meeting?

A. That was at Mr. Sweetser's office, as I recall.

Q. Where is his office?

A. In San Francisco, at the office of the Bureau of Public Roads.

Q. Have you concluded your observations on that date? A. Yes.

Q. Upon what next occasion did you go to the tunnels?

A. Well, either on the 9th or the 10th; I believe it was on the 9th, I anticipated that there would be continuing problems developing in regard to the tunnels, and also I felt that we had gotten over our principal hurdle, and spoke to Mr. Boggs about the advisability of settling all of the problems between the Contractor and the District to see if it would not be possible to clear up these problems, determine the merits of the claims of the Contractor—

Mr. Wittschen: Any conversations going toward arbitration and claims would be entirely immaterial here, and could not bind the Board of Directors. That was not within the scope of Mr. Boggs' authority, and I object to anything of that kind, on the ground that they were not consummated, and, not having been consummated, they cannot be gone into.

(Testimony of Otto W. Peterson.)

Mr. Smith: If it please the Court, the testimony seems to me to be testimony that should be developed to establish what was done [1860] by the Contractor and the efforts that were being made and the delays that resulted, in general, to give the Court all the facts concerning the situation.

The Court: What delay have you in mind now?

Mr. Smith: I don't know what the answer will be.

The Court: You don't know what the answer will be?

Mr. Smith: The exact answer on this particular subject.

The Court: The exact answer. What delay have you in mind?

Mr. Smith: The Contractor was engaged in negotiations, through Mr. Peterson, with the District, in an effort to speed up the work and to arbitrate any dispute—

Mr. Wittschen: Well, arbitration of claims is not involved.

The Court: Arbitration is not in issue. It has no place in the case on the merits.

Mr. Smith: Q. Proceed, Mr. Peterson, and delineate the conversation you had, omitting reference to arbitration.

A. On my next visit—there was no particular conversation on those two dates except that which referred to arbitration,—nothing of consequence.

(Testimony of Otto W. Peterson.)

Q. What was the next occasion when you went to the tunnels?

A. My next visit was on October 13th. I spent several hours there in looking over the work carefully,—the timber work, particularly,—with Mr. Hindmarsh.

Q. What was the condition of the work at that time; was excavation in progress?

A. No. The timber work and concrete lining were the classes of work which were in progress.

Q. What was the next occasion of your visit to the tunnels?

A. On October 20th, I went over the tunnel work with Mr. Hindmarsh and Mr. Havis,—Mr. Havis of Mr. Kaiser's office,—to check over the amount of work that remained uncompleted, and to see that we had everything ordered and all plans were prepared to go ahead with [1861] excavation just as soon as the concrete was finished; reviewing the work generally.

Q. Did you observe the ground conditions in the workings at this time?

A. Yes; not so particularly on that day more than others, though.

Q. When was the occasion of your next visit to the tunnel—

A. The next visit was on the 31st of October. I went carefully through the second cross adit, and looked particularly at some of the formations that were in that area, because it gave a very good cross

(Testimony of Otto W. Peterson.)

section of the hill between the two tunnels, gave better exposures than were generally observable in the tunnels themselves; and I was particularly interested in the soft puttylike deposit that ran like a faulted gouge, and was interested in determining the extent of these deposits, and also in observing their similarity with other whitish deposits that were in evidence in the easterly part of the two bores that to that time had been excavated from the west portal. It was a type of intrusion which cut across the formation and greatly weakened the structure of the chert particularly, and I was interested in trying to determine the nature of it and what the probable extent of that might be, and the work that remained to be done.

Q. You heard the testimony of Mr. Page here the other day, I believe you said? A. Yes.

Q. Was that the same material that you mention that Mr. Page described as a diabase dike?

A. That was the same material, yes.

Q. Did you see some of that material on this particular occasion,—on October 31st,—when you were there?

A. I saw some at that time in the cross adit, and also particularly in the forward part of the headings, as they excavated from the west portal.

Q. Have you concluded your observations on that day? A. Yes. [1862]

Q. Upon what next occasion did you go to the tunnel?

(Testimony of Otto W. Peterson.)

A. I next visited the tunnel on November 2nd. Nothing of any particular import on that day, other than—

Q. Did you see Mr. Boggs on either one of these last visits you mentioned, or any occasion prior to that?

A. I visited Mr. Boggs all of the forenoon of October 31st. Our discussion had to do, in the main, with matters which are not under discussion at this time, I guess.

Q. When did you next go to the tunnels or see Mr. Boggs?

A. I saw Mr. Boggs, again, on November—Mr. Boggs and Mr. Tinning on November 1st. That was a conversation at Mr. Boggs' office.

Q. Thereafter, when was the next occasion?

A. On November 2nd, I was in the tunnel during the forenoon, looking over all work very carefully; going ahead with timber surveys and checking up on the progress,—the activities of the various crews; going over the work with the superintendent.

Q. Had excavation been resumed as yet?

A. No, sir.

Q. What was the occasion of your next visit and the date?

A. The next visit was on November 8th. I went through the slide area on that date, with Mr. Larson; and the work was pretty well along toward completion, as I recall.

Q. The next date?

(Testimony of Otto W. Peterson.)

A. I was there on the next day, also, November 9th; and again looked over the area of the first cave-in quite carefully.

Q. And they were still working there?

A. Yes.

Q. The Contractor's forces. What other work were they doing on this occasion, as you recall, in general?

A. Well, they were carrying on the concrete lining work and footing work and timber work, square-setting. [1863]

Q. What was the occasion of your next visit, or the date of it?

A. On November 17th, I made a visit and went over all of the work with the superintendent, Mr. Hindmarsh.

Q. What was the Contractor doing at that time?

A. Well, about that time, it is my recollection that he resumed tunnel driving in the south tunnel, proceeding with the side drifts and carrying that work forward. The main excavation,—the concrete had at that time advanced to a sufficient point in the south tunnel, in both tunnels, in fact, so that work could proceed,—excavation work could proceed in the south tunnel.

Q. Did you observe the methods being employed by the Contractor?

A. Yes; the bottom drift system.

Q. Were they in accord with standard tunnel practice? A. Yes.

(Testimony of Otto W. Peterson.)

Q. Upon what occasion did you next go to the tunnels?

A. Next visit was on December 11th. I went through the tunnel with Mr. Price, and checked over all of the work being done, particularly the heading work proceeding in the south tunnel.

Q. Were you at the tunnel on November 30th?

A. Yes, I was at the tunnel on November 30th, also; also went over the work with Mr. Hindmarsh, the superintendent.

Q. Did you observe the ground conditions at that time in the south tunnel?

A. Yes. The work of squaresetting and putting the tunnel in shape had been well advanced to completion. The tunnel was particularly heavy; the north tunnel, near the heading, right where the last work was completed. I noticed particularly, on this and other visits, that some of the heaviest ground in the tunnel was right over and immediately forward of the shovel where it further excavated at the toe of the core in the north tunnel; and a similar condition was—— [1864]

Q. Had the Contractor resumed excavations in the north tunnel on this date?

A. I do not recall just when he resumed excavations. It was some time in the month of December; about the middle of December, as I recall.

Q. After November 30th, or, I believe, you stated December 11th, what was the next date of a visit to the tunnels?

(Testimony of Otto W. Peterson.)

A. On December 21st I visited the tunnel headings, with Mr. Hindmarsh; and I think that at this time, as previously stated, the work of excavating was also resumed in the north tunnel headings.

Q. Did you observe the working conditions and the work that was being done by the Contractor on those visits?

A. Yes, sir; in the north tunnel, they proceeded with the wall plate drift system and top heading.

Q. Was the work being done in accordance with standard tunnel construction practices as you understand them?

A. Yes, it was.

Q. What was the date of your next visit to the tunnels?

A. My next visit was on December 28th. I again went over the various headings, through the various headings and over the work with Mr. Hindmarsh. The work was actually in progress,—excavating the headings and bench and so on, in both the north and south tunnels.

Q. When did you next go to the tunnel?

A. On the 29th of December, I also went through the tunnel with Mr. Hindmarsh.

Q. And the Contractor was excavating in both tunnels by that time, as I understand it is that correct?

A. Yes.

Q. Did you observe the ground conditions encountered in the headings and the timbering methods employed by the Contractor?

A. Yes.

Q. What observations did you make?

(Testimony of Otto W. Peterson.)

A. Well, the work was being carried forward in a good, workmanlike manner, with as much energy as possible.

Q. When did you next visit the tunnels?

A. My next visit was on [1865] January 25, 1936.

Q. 1936? A. 1936.

Q. All the visits you have testified to ending in December were in the preceding year?

A. Yes, sir.

Q. Now, this is 1936?

Mr. Tinning: What date was it, Mr. Smith?

The Witness: January 25th.

Mr. Smith: Q. What did you observe on that date, if anything, Mr. Peterson, as to the ground conditions and the work being done, and the manner in which it was being done?

A. Well, they were excavating in chert formation in both tunnels. There were quite a number of diabase dikes in evidence. The work was going forward as rapidly and in as workmanlike manner as possible.

Q. Did you observe any effect of the diabase dikes on the work?

A. Yes; there were places—there was very heavy ground where these dikes had cut across the formation and broken the bond overhead, or permitted these disjointed masses to slide on the lubricated diabase planes, exert pressure toward the tunnel excavation.

(Testimony of Otto W. Peterson.)

Q. Was there any trimming of timbers necessary at that time in order for the Contractor to install the concrete section as designed?

A. There was trimming of timbers required at all times. There were special places where the timber was forced in.

Q. Was there any resetting of timbers or replacement of these timbers necessary? A. Yes.

Q. Was that work proceeding at that time?

A. Well, the major part there was— Yes, that was still going forward.

Q. Was that in the new excavating?

A. Some of it was in the new excavation, yes.

Q. How long had the timbers that were being reset, or replaced, been in place?

A. Some of those timbers had been placed just a very short [1866] time,—a week or ten days.

Q. They had moved to the extent necessary to require replacement?

A. Occasionally, yes.

Q. When was the next visit,—the occasion of your next visits, Mr. Peterson; and who was with you?

A. I next visited the tunnel on February 10th. Mr. Boggs, Mr. Lippincott, Dean Derleth and Mr. Hindmarsh, as I recall, were present in the tunnel at that time, and we looked over particularly the work of advance driving in the tunnel and the type of construction in progress.

(Testimony of Otto W. Peterson.)

Q. Did you have any conversation with Mr. Boggs at that time?

A. It is my recollection I did. [1867]

Q. Will you state what the conversation was?

Mr. Tinning: Will you have him state who was present?

Mr. Smith: I think he has stated who was present.

Q. Who was present at the conversation you mentioned—all of the gentlemen you have named?

Mr. Tinning: Who was within hearing.

A. They were all about.

Mr. Smith: Q. Who was within hearing, or do you know?

A. I don't know. I had a conversation with various ones of the party, I think several of them, but particularly with Mr. Boggs, and discussed the progress and the way the work was proceeding, and Mr. Boggs expressed approval of the way the work was being carried on, and then my recollection is Mr. Lippincott also expressed approval of the way the work was being carried on by the contractor.

Q. Does that complete your statement as to that particular day? A. Yes.

Q. Upon what occasion did you next visit the tunnels?

A. On February 15 I made a visit to the tunnel; Mr. Boggs, Dean Derleth and Mr. Van Norman were there. We looked through the tunnel work and discussed the manner in which the work was

(Testimony of Otto W. Peterson.)

being conducted and the progress, and again it is my recollection I spoke with Mr. Boggs and also Mr. Van Norman, too, if they had any criticism, or suggestion, or advice, and they expressed themselves as—expressed satisfaction with the progress and the manner in which the work was being carried forward.

Q. Were you referring in any way in what you said to the timbering methods that were employed at that time? A. Yes.

Q. The comments that were made included comments on the timbering?

A. That is what I was particularly interested in covering in the discussions. [1868]

Q. When did you next go to the tunnels, Mr. Peterson?

A. The next visit was early in the morning of February 22 of 1936.

Q. That was on the day of the cave-in of that date? A. Yes.

Q. Had you been at the spot where the cave-in occurred during your last preceding visit on February 15, which you testified to, as far as you know?

A. It is my recollection that I was in the headings, but I do not believe, I am quite certain that the main bore excavation had not been completed at the time of my visit the week previously, but that the wall plate drifts were excavated.

Q. It is your recollection that on February 15, when you were there at the spot where the cave-in

(Testimony of Otto W. Peterson.)

occurred on February 15 that the drifts were under construction?

A. That is my recollection.

Q. What did you observe concerning the February 22 cave-in as to, in your opinion, its cause?

A. I arrived while the material was still caving, and noticed it came in mainly from the area above the south wall plates, and in the arch in the north tunnel; it came in about, above the arch, some five or six feet—several feet—and developed laterally up to the south, to the sides and upwards, and kept expanding, and I noticed the type of material, there was a considerable amount of white material, that diabase, white diabase, which came down at this place in lumps of considerable size, varying from large lumps to finer products.

Q. Had the timbers been broken or snapped in the part of the cave-in as far as you observed?

A. No, the timbers were not broken, but had come in bodily; it appeared that a thrust had caused this cave-in, the thrust coming from the upward and from the south side of the arch.

Q. At what point on the line of the arch did you form the opinion the cave-in started?

A. I would roughly say a quarter of the way from the wall plate up to the crown, or just above the wall plate, [1869] and developed upward in both directions, forward and backward, as the cave expanded.

Q. It is your opinion it began—you observed and formed the opinion that it began at the first or sec-

(Testimony of Otto W. Peterson.)

ond segment above the wall plate?

A. I would say about the second segment would be the locality.

Q. That would be on the south side of the north tunnel? A. Yes.

Q. What else did you do on the day of the cave-in when you were there, if anything?

A. I observed the bulkhead which was being thrown up; I went up on the catwalk adjacent to that and viewed it from all angles as closely as I could, to observe it as much as possible.

Q. Did you return to the tunnel after February 22nd?

A. Yes, I returned the next day, on the 23rd, and looked over the area of the cave-in further. At that time the debris had come down so that one could not see as much of the area from which the cave had started, and the debris had come down sufficiently to fill the tunnel and block the area of the roof pretty generally adjacent to the cave.

Q. After February 23 did you go to the tunnel at all?

A. I went to the tunnel on February 24 and attended a Safety Commission hearing which was held on that date.

Q. You mean the Industrial Accident Commission?

A. The Industrial Accident Commission hearing.

Q. Where was that hearing held, at the tunnel?

A. It was at the tunnel, yes.

(Testimony of Otto W. Peterson.)

Q. What was the occasion of your next visit, if any, to the tunnel?

A. The next visit was on the 26th of February; I went over the tunnel work again with Mr. Hindmarsh, the superintendent.

Q. After that did you make a visit to the tunnel again, and when? [1870]

A. The next visit was on March 3, 1936, that was the last visit.

Q. You visited the tunnel during construction for the last time?

A. The last time that the Six Companies were engaged in this contract.

Q. In other words, after March 3, 1936, you did not again go to the tunnel prior to June 13: is that it?

A. Yes.

Q. 1936? A. Yes.

Q. From your observation of the conditions as you saw them in the tunnel did you form an opinion as to whether or not the ground in which these tunnels were being driven was or was not self-supporting? Did you form such an opinion?

A. Yes, I did; it was not self-supporting.

Q. It would require timbering?

A. Yes, throughout.

Q. Throughout? A. Yes.

Q. And during your visits to the tunnels did you form any opinion as to whether or not the timbering methods pursued by the contractor were in accord with standard tunnel practice?

A. Yes.

(Testimony of Otto W. Peterson.)

Q. Were they?

Mr. Wittschen: Objected to as immaterial.

The Court: I will allow it.

Mr. Wittschen: Exception.

A. They were.

Mr. Smith: Q. Was the work of the contractor delayed by anything you observed while you were at the tunnel on these trips of inspection? A. Yes.

Q. For what reason?

A. There were delays, first of all, at the West Portal excavation, due to caving of the banks, difficulty of gaining access to the portals until the excavation was completed. In my opinion, the work of driving the tunnels, themselves, was substantially delayed because of the ground conditions which were encountered, the reason being that the ground was very much heavier [1871] and more difficult to excavate in than the contractor anticipated.

Mr. Wittschen: Just a moment.

The Court: What the contractor had anticipated may go out.

Mr. Wittschen: He may state the nature of the ground and we won't object to that.

A. May I have the question again?

Mr. Smith: Q. The reasons for delay, I asked you the reasons why the contractor was delayed.

A. He was delayed because of the fact, the major reason was because of the fact that the tunnels were very much more difficult tunnels to build and excavate and timber than it was estimated they would be.

(Testimony of Otto W. Peterson.)

Mr. Wittschen: I ask what was estimated to be go out.

Mr. Smith: I think that is a perfectly proper answer. It is an opinion as to why they were delayed.

The Court: What was estimated may go out.

Mr. Smith: Q. Was the contractor delayed by the cave-ins? A. He was.

Q. In your opinion for how long a time?

A. For a period of 90 to 120 days, because of the first cave-in; that covers not only the time of actually clearing up the cave-in, but to complete other work or to do other work in a different way because of the cave-in, square-setting, and the modification of the tunnel lining, and various things that arose out of that occurrence.

Q. Have you finished your answer?

A. The refusal of the Accident Commission to permit timbers to be moved, the general change in the construction procedure, all revolving around that occurrence.

Q. As far as the February, 1936, cave-in was concerned, was there any delay occasioned by that?

A. There was.

Q. How long was that delay?

A. That was a delay of about 60 days.

Q. How long a delay was occasioned by the causes that you mentioned a [1872] few moments ago at the west portal, and outside of the west portal, in the approach?

(Testimony of Otto W. Peterson.)

A. From one to two weeks' delay was occasioned at the west portal in excavating the approach cut and getting started on the tunnel work.

Q. And in the west portal section of the tunnel that you mentioned, the same question.

A. There there was probably a delay of about one to two months because of the plan that had to be followed to excavate and build these particular tunnel sections, and the special difficulty of the ground at those places.

Q. In your opinion what progress would have been normal progress for the contractor to make as you observed the contractor's forces and equipment in the construction of these tunnels, in the excavation of the tunnel bore in feet per day, if the ground had been self-supporting?

Mr. Wittschen: Objected to as immaterial and argumentative, and calling for his conclusion.

The Court: I will give him a record. I will allow it.

Mr. Wittschen: Exception.

A. Nine to ten feet a day.

Mr. Smith: Q. Had you made an examination of the progress which the contractor had made in the main excavation east of the west portal work, from the west portal in? A. Yes.

Q. What actual progress was the contractor able to make?

A. He was able to make an actual over-all progress, including the delays encountered, of approxi-

(Testimony of Otto W. Peterson.)

mately $3\frac{1}{3}$ feet per day. During the time they actually drove, eliminating the delays his progress was approximately $4\frac{1}{2}$ feet per day.

Q. Was the progress of $4\frac{1}{2}$ feet per day made apart from the delays occasioned by the cave-ins and from special causes, in your opinion, a normal and fair rate of progress in the ground encountered? A. It was.

Q. What, in your opinion, was the total delay experienced by the contractor, in days?

Mr. Wittschen: I can add it up for you. It would be a maximum of 180 and 14 and 60, or 254, and a minimum of 50 or 60 less.

Mr. Smith: I do not think the computation is right.

A. I would say about 300 days.

Q. Mr. Peterson, I will show you Defendant's Exhibit G-4, which as I understand it purports to be a correct representation of the timber in the north tunnel, a portion of the north tunnel, toward the west end, having the station numbers thereon, and I will ask you to state to the Court whether, in your opinion, that exhibit correctly portrays the timbering as you examined it in the tunnel?

A. It appears to portray a certain part of the timbering, the posts and wall plates and segments.

Mr. Tinning: That is all it is intended to represent.

Mr. Smith: Q. It does not include the collar bracing or lagging, does it? A. No.

(Testimony of Otto W. Peterson.)

Q. Did you check to see whether it correctly illustrates the timber as far as you could find it?

A. I have not attempted to make a detailed check.

Q. Is collar bracing an important part of the tunnel timbers? A. Yes.

Q. What was its function?

A. Well, the collar bracing is put in between the segments, particularly to give them lateral bracing and make them more effective as columns to support the lagging.

The Court: I should say the tunnel has been braced up sufficiently for all purposes of this case, as far as construction is concerned. We have had diagrams and maps and figures, and it goes without saying that it was braced up in this heavy ground that [1874] you are talking about.

Mr. Smith: Q. Mr. Peterson, did you observe the blasting methods and shooting methods employed by the contractor? A. Yes.

Q. When you were on the work? A. Yes.

Q. Were those methods, in your opinion, in accord with standard and customary tunnel construction practice? A. They were.

Q. In connection with the estimate for the construction of this tunnel, Mr. Peterson, was the contractor justified in estimating that he would drive this tunnel entirely from the west end without going to the east end?

Mr. Wittschen: Objected to as calling for the

(Testimony of Otto W. Peterson.)

opinion and conclusion of the witness on a matter that is not the subject of expert testimony.

The Court: Someone developed that in this case, that tunnels were driven on both ends. This testimony, I take it, is in answer to that. Who developed that, I think it was you, was it not?

Mr. Wittschen: No, we did not.

The Court: If my memory serves me you indicated that construction ought to have been going on at both ends.

Mr. Tinning: If I remember, your Honor, some witness testified it was not possible to drive from both ends, and on cross-examination we developed certain ideas in connection with it.

The Court: I will allow you to go into it briefly in the matter of time.

Mr. Smith: Q. Do you know the question?

A. Yes.

The Court: It is conceded it would be the most economical.

Mr. Smith: There are many other reasons.

A. The first thing for the contractor to determine was the type of ground and for this particular tunnel the time of 720 days was an ample time to drive the tunnel, this particular tunnel, as the [1875] ground conditions were indicated from one end only. Here he had two parallel bores approximately 3000 feet long in which progress of 9 to 10 feet per day could be made except for very short special sections. Secondly, the material from the

(Testimony of Otto W. Peterson.)

tunnel which was suitable for road purposes was all to be used in the low westerly portal of the tunnel; the contractor was required to place such suitable material as the District might direct in these roadway fills, and in order to deliver the good material he likewise had to haul, or would logically haul the poor material to the same westerly heading so as to be sure that he would be prepared to meet that requirement. That was the reason, there was ample time and there was the reason that the material was logically to go to the roadways at the west end. Aside from that, naturally a contractor would prefer to drive the tunnel from the west heading for economic reasons, because of the driving up hill and handling of water; also for the reason that there was ample construction space at the west end and that it was possible to drive only part of this tunnel from the east end, but the contractor had no reason to feel that he should spend money for additional plant to drive downhill on a steep grade of 4 per cent., which is quite unusual grade for tunnels, not unusual for some highway tunnels, but it is out of the ordinary for tunnels; then there were reasons of economy, as well, that justified him to do all of his work from the west end as long as he was sure he could complete the job within the required time.

Mr. Smith: Q. Mr. Peterson, are you familiar with the amount of profit that is customary for the

(Testimony of Otto W. Peterson.)

contractor to estimate in the construction of tunnels? A. Yes.

Q. What is the customary amount?

Mr. Wittschen: Objected to as being conjectural and speculative and no bearing on this case, and proving no issue, and immaterial.

The Court: The objection will be sustained unless it is dis- [1876] closed how much profit was made in the Boulder Dam. I think that would be helpful.

Mr. Smith: May it please the Court, the evidence is addressed to the proposition, of course, that in this case the plaintiff is suing to recover a reasonable value of the work done, which includes, on our theory, a reasonable cost thereof plus a reasonable profit, and this witness is qualified to state what the normal and customary profit is in tunnel construction. I think he is fully qualified in that department.

Mr. Wittschen: Aside from that, I have innumerable cases which I would like to present, that on a question of quantum meruit you have to take the cost without a profit.

Mr. Smith: Of course, we have cases to the opposite.

The Court: I think I can express my view to you. I have it in mind and will do so if you wish.

Mr. Smith: I would like the witness to be permitted to answer the question.

(Testimony of Otto W. Peterson.)

The Court: I will give you a record on it in any event, so if I am in error I will have an opportunity to check it.

Mr. Wittschen: Note an exception.

A. The usual profit figured by a contractor on tunnel work is $17\frac{1}{2}$ per cent.

Mr. Smith: That is all.

The Court: We will take a recess for a few minutes. [1877]

(After Recess)

Mr. Tinning: At this time, if the Court please, the defendants in this action offer in evidence the grant agreement between Joint Highway District No. 13 to the State of California and the United States, which contains the provisions with respect to the obligations of the District as to the modified form of plans and specifications in the construction of its project.

Mr. Smith: The offer will be objected to on the ground it is incompetent, irrelevant and immaterial; has nothing to do with the contract between the plaintiff and the defendants in this action; was not referred to or made a part of it in any way or mentioned in the contract between the plaintiff and the defendants in this action. As a matter of fact, it was never directed to the attention of the plaintiff, and the plaintiff was unable to obtain a copy of same until about a year after the contract was entered into. It is absolutely immaterial and has no bearing

(Testimony of Otto W. Peterson.)

on the issues in this case whatever. There is no privity of contract whatever between the PWA and the plaintiff in this case.

Mr. Alexander: The cross defendant surety companies make the same objection, your Honor.

Mr. Tinning: If the Court please, the specific supplement and amendments to January 9, 1934, contain a provision with respect to this contract that the obligation of the Contractor under the contract with the District to comply with all of the regulations of the PWA then in effect and thereafter promulgated and this specifically is already in evidence. The provision that I have in mind reads as follows:

"The attention of all bidders is hereby——"
[1878]

Mr. Smith: What page are you reading from?

Mr. Tinning: Page 3 of the first supplement.

Mr. Smith: Of which supplement?

Mr. Tinning: I have already referred to it, Mr. Smith.

Mr. Wittschen: The first one. There is a first and second supplement.

Mr. Tinning: January 9, 1934:

(Reading:) "The attention of all bidders is hereby specifically called to Bulletin No. 2 of Federal Administration of Public Works entitled 'General Information and Instructions for the Guidance of State Advisory Boards and State Engineers (P.W.A.)' A grant of thirty

(Testimony of Otto W. Peterson.)

(30) per cent of the cost of labor and material used in the project of the District has been made by the Public Works Administration of the United States under the terms of said National Industrial Recovery Act, and all bidders are hereby advised that the Directors of the District will cooperate with the Public Works Administration and all its officers and employees in the enforcement of all of the provisions of said National Industrial Recovery Act and the rules and regulations heretofore and hereby promulgated applicable to the performance of the work on the project of the District." [1879]

There are certain provisions in the contract between the District and the PWA of the United States which require the structure to be constructed in accordance with the plans and specifications with such minor alterations or modifications may be from time to time approved by the second party,—that is, the United States.

Mr. Smith: It is very obvious, from the reading by counsel, in the clause, notice to bidders, which he read aloud to your Honor, that it refers entirely to labor conditions under the National Industrial Recovery Act, or the NRA as it was known at that time. In other words, there is no question about the performance by the Contractor of this contract; it had to be pursuant to the conditions laid down by the regulations of labor and the conditions of labor by the Act involved in accordance with regulations

(Testimony of Otto W. Peterson.)

put out by the PWA; but that is totally different from a long agreement between the District and the PWA, by which the District borrows money, and copies of which were never furnished to the bidders or the Contractor. We renew our objection.

Mr. Tinning: Your Honor, the offer is made because of the fact that it was necessary for the District to secure authority to make any modification or change in its plans or specifications.

The Court: Their answer to that is they had no knowledge or notice of it.

Mr. Tinning: We think, however, the specific provision for it——

The Court: I will give you a record on it. I will allow it subject to a motion to strike and over your objection.

Mr. Smith: Note an exception.

Mr. Alexander: Exception, your Honor.

(Thereupon, the document was marked "Defendants' Exhibit O-4.")

[Set forth in the Book of Exhibits at page 471.]

Cross Examination

Mr. Tinning: Q. Mr. Peterson, when you came on this work, were [1880] you employed as an expert when you first came in contact with the Broadway Low Level Tunnel?

A. When I first came in contact with this work, my visits were personal.

(Testimony of Otto W. Peterson.)

Q. Well, you said that this morning. Were you employed as an expert or were you going out voluntarily to help a friend?

A. No; I did not go out to help anyone. I just went out to visit this tunnel project.

Q. You mean to inspect it for your own purposes?

A. No; not— Just personal visits with Mr. Larson and Mr. Whitmire and Mr. Fontaine and Orselli, and others that I knew out there.

Q. When you made those visits, you observed the work?

A. Yes.

Q. When you went out there on August 5, 1935, did you go as an employed consultant, or did you go as a friend of S. D. Bechtel and Mr. Phillips?

A. I went primarily as a friend of Mr. Bechtel and Mr. Phillips; I was not actually employed at that time.

Q. When were you first employed by Six Companies, the plaintiff in this case?

A. Beginning at the time of the first cave-in, when I was called upon to go up and inspect the cave-in in the tunnels.

Q. When you went out there on the morning of the 29th of August, 1935, where you spent all morning and then went with engineers of Six Companies to the Joint Highway District office, were you employed by Six Companies at that time?

A. I considered that I was, yes. I was asked by Mr. Bechtel specifically to go out there and do that. There was nothing further said than that he wished

(Testimony of Otto W. Peterson.)

to have me join as one of a group of engineers to consult on the job.

Q. Did you afterwards receive compensation?

A. No, sir.

Q. For that visit?

A. No; I did not, at that time. I figured I would get it.

Q. Did you receive it? A. Yes. [1881]

Q. But none prior to that time?

A. Not that I recall.

Q. Were you employed by any one of the constituent companies that form the plaintiff in this action,—Six Companies of California,—during the period referred to, prior to August 29, 1935, and after June 4, 1934? A. Prior to August 29th?

Q. The time of your employment in this matter?

A. Yes, I have done work previously for some of the companies.

Mr. Smith: He limited it to one year.

The Witness: One year. Within a period of one year, I had done work for some of the companies.

Mr. Tinning: Q. For how long prior to June, 1934, had you worked for any of the companies?

A. For how long prior?

Q. Yes. Just generally, Mr. Peterson.

A. Oh, possibly 5 years; some incidental things that were done.

Q. Starting from a time in 1927 and 1928 up to the present date, you have been continuously employed as an engineer by the Pacific Gas and Electric Company? A. Not continuously; no, sir.

(Testimony of Otto W. Peterson.)

Q. From 1927 up to now, how long have you been away from your employment with the Pacific Gas and Electric Company?

A. I have not been away; but my pay has not been continuous,—if that is the test.

The Court: Q. You got a leave of absence?

A. Yes, sir.

Q. Covering a period of time?

A. Oh, just a matter of a few weeks or possibly a month or two in the aggregate.

Mr. Tinning: Q. Were you on a leave of absence from the Pacific Gas and Electric Company when you were in charge of the work of recovering the Broadway Tunnel?

A. I was not on a formal leave of absence at that time; no.

Q. Were you receiving compensation from them at that time?

A. Well, it is my practice not to charge for work that I don't do. [1882]

Q. Well, Mr. Peterson, if you would answer the question, we would get along faster. Were you receiving compensation from the Pacific Gas and Electric Company at the same time that you were doing this work on the Broadway Tunnel?

A. During the same period, yes.

Q. When you inspected these tunnels shortly after the slide on August 28, 1935, one of the things you recommended was the immediate concreting of old portions of the timber in the unconcreted tunnel, was it not?

A. Yes.

(Testimony of Otto W. Peterson.)

Q. The slide on that date was caused by the workmen while the workmen were removing timbers which had intruded into the tunnel section?

A. Yes.

Q. At a place where the timbers had been standing unsupported by the permanent lining for some 6 or 7 months?

A. That is approximately correct; I do not know the exact time.

Q. Did you recommend, at any of your visits prior to the 29th of August, 1935, that Six Companies place the lining in the tunnel?

A. No, sir; I did not make recommendations to the Company.

Q. Well, you had friends working in the Company?

A. Yes.

Q. You never discussed that with them?

A. I discussed their concreting plans with them, in a personal way, and they said they were doing all they could to go ahead with the concreting of the tunnels. I did not feel that it was my province to be too inquisitive as to the details of their particular arrangement.

Q. Did you think it was good practice to leave those timbered sections unlined for this period of time?

A. Yes, if I may give my full reasons.

Q. Well, the point is you thought it was good practice?

A. Yes.

Q. Go ahead and give your reasons.

(Testimony of Otto W. Peterson.)

A. I observed the ground that they were going through, and I discussed the type of ground which both Mr. Larson and Mr. Whitmire expected to encounter; and they ex- [1883] pected to go into very much better ground, into chert, and it would be self-supporting, and everyone was very optimistic about the stability of the ground which would be encountered later; and, with that expectation and with the practice that I have had of driving tunnels, excavating tunnels, either completely or to a substantial extent before concrete started, I saw no reason why they should not proceed along the same lines in this particular tunnel.

Q. The ground, you say, though, was heavy that they had passed through when you got there?

A. Portions of it were; largely at the portal and immediately adjacent to the portal section.

Q. You were out at the tunnel on the 14th of April?

A. Yes.

Q. You said the tunnel was all in heavy ground?

A. Yes; it began to look discouraging at that time, and along, possibly the latter part of that period, as August approached, I felt, particularly in the latter part of August, at that time that concrete should follow along energetically; but it is customary to allow excavation to proceed about 5 to 6 months in advance of concreting, providing the ground is ground as it was in this tunnel, the area of the Monterey sandstone, and with the expectation of better ground, to follow up with the lining.

(Testimony of Otto W. Peterson.)

Q. Well, had you ever seen a tunnel driven in Monterey sandstone before, Mr. Peterson?

A. I have seen tunnels driven in—I don't know that I have seen the Monterey sandstone. I am not a geologist. I have seen sandstone. They have some Franciscan sandstone in the Islands that may be related to it.

Q. You just stated it was customary to leave Monterey sandstone tunnels open for 6 months?

A. No; I did not intend to make that statement.

Q. Well, we will get to that.

Mr. Smith: I believe he said ground like the sandstone. [1884]

Mr. Tinning: Q. Mr. Peterson, did they leave the Franciscan sandstone, the Yerba Buena Tunnel, open for 6 months?

A. I don't know just how long that tunnel was left open. That was a different type of a job entirely.

Q. Well, you referred to it?

A. Yes; it was a different type of construction entirely; different methods.

Q. You say it was a different method?

A. Yes.

Q. And they left the core in, supporting the tunnel against the core until the lining was placed; then took the core out?

A. Yes.

Q. Steel beams?

A. Yes.

Q. Do you believe that the Franciscan and Monterey sandstones are comparable?

A. Well, I don't think—I would rather not go into a geological discussion. My observations were

(Testimony of Otto W. Peterson.)

mainly to the suitability of formations and not to the technical geological terms.

Q. Then, what we are discussing——

A. Well, the Franciscan can be a very unstable formation and a very sound one; likewise, the Monterey.

Q. Let's take the one you refer to?

A. Well, then you have to go to the type.

Q. Well, Mr. Peterson, if you will listen, we will get to that.

A. All right.

Q. The type we are referring to is the Franciscan, to which you referred on the Yerba Buena Tunnel. I am asking you whether you considered material in that tunnel comparable to the material in the Broadway Tunnel as to suitability; and I am referring to material in the Monterey sandstones to which you referred.

A. I don't think you can compare those two tunnels at all by the material; they were in part the same, and there was some very bad material in the Yerba Buena and some very good material; and the material was all grouted before the tunnel was built, and it was all in its natural state. It is an entirely different type of tunnel, [1885] and I don't think you could compare——

Q. Then you wish to withdraw your comparison?

A. Yes, I will withdraw it, if I made one.

Q. Well, I thought you did. You stated that, in your conferences that you had after you were employed by Six Companies, you were seeking to find

(Testimony of Otto W. Peterson.)

a solution of the problems that you found in the tunnels? A. Yes, sir.

Q. Which included timbers which were hazardous? A. Yes.

Q. You told about seeing the heavy ground in the tunnel. Did you have any other object, when you were discussing this matter with the District—

A. None whatever, when I entered the employment.

Q. —did you have any object or intention to try to cause the District to change its design of the tunnel lining?

A. No; not when I started the work.

Q. How soon after you started the work did you obtain that object?

A. I don't know; I don't think that I obtained that object at any time. I made some suggestions before I realized that it was the province of the District to determine the design; but any suggestions that were made were made purely as suggestions.

Q. Did you entertain the idea in your own mind at that time that the design of the lining of this tunnel should be changed and strengthened?

A. If I were the Engineer—

Q. Will you answer "Yes" or "No," please, and then explain? A. In my own mind?

Q. Yes A. Yes, I did. [1886]

Q. When did you first conceive that idea?

A. When I saw the type of ground that the tun-

(Testimony of Otto W. Peterson.)

nel was being driven in and the force of the formations acting there.

Q. You studied the plans and specifications and you knew there were to be B sections provided for with an invert? A. Yes.

Q. Did you ever recommend in any of your conferences with the District representatives that the inverted sections should be installed in heavy rising ground? A. No.

Q. You were present at some meetings with some of the District representatives, at least with Mr. Sanborn, were you not? A. Yes.

Q. Mr. Sanborn was an associate professor from Columbia University, of New York?

A. Well, I think he was at one time. I do not believe he was at this particular time. I do not know what his connections were.

Q. He made recommendations in your presence, did he not, to the District's representative?

A. Yes, he did.

Q. What were they?

A. He thought the tunnels should be very substantially strengthened in several respects, that a substantial invert should be added, that it should have a good drainage system, and he thought that the side walls and arch should be strengthened.

Q. Should be thickened? A. Yes.

Q. With additional concrete?

A. That was his idea.

Q. That required a complete change in the design of the tunnel under which the contractor was

(Testimony of Otto W. Peterson.)

proceeding with the work, did it not? It would be at the same location but it would be an entirely different structure, would it not?

A. Well, it would be a similar structure, it would not be entirely different. I would say it would be very much the same.

Q. You think it would?

A. Yes, much the same, except it was more [1887] substantial in thickness and dimensions.

Q. Dimensions of walls? A. Yes.

Q. How thick did he want the side walls?

A. I don't remember his exact dimensions. He was telling his own story.

Q. You were listening to it?

A. I listened to it.

Q. You listened to a lot of other things he had to say, did you not? A. Yes.

Q. Didn't you pay much attention to what he had to say? A. I listened with interest.

Q. Didn't you arrange to have Professor Derleth listen to it?

A. Yes, he wished to have an opportunity to present his views and I arranged for a conference between the two, but it was Mr. Sanborn's presentation that was being made.

Q. You did not object to it?

A. No, I was an auditor.

Q. That was on September 4, 1935, was it not?

A. That is correct, I believe.

Q. And it was at the tunnel where Mr. Price and Mr. Sanborn and yourself and Professor Derleth had the conference? A. No.

(Testimony of Otto W. Peterson.)

Q. Where was it? A. It was at the tunnel.

Q. What is wrong about what I said?

A. Your surroundings, your attendance is wrong.

Q. Tell me who was present.

A. Just Professor Derleth, Mr. Sanborn and myself.

Q. Mr. Price was not there? A. No.

Q. I was 25 per cent. wrong. Mr. Sanborn at that conference stated in substance and effect, did he not, that he wanted to change the design of the tunnel lining sections by constructing an invert floor three feet in thickness, he wanted to add to the thickness of the section of the walls throughout the arch, and in his plans he entirely eliminated any consideration of the effect on the ventilation [1888] system, did he not?

A. I don't remember the details, Mr. Tinning.

The Court: Whose money was he spending?

Mr. Tinning: Q. Do you remember that in that conversation that after Mr. Sanborn had read his report and explained it to Mr. Derleth he asked Professor Derleth what he thought of the report?

A. I don't remember his reading a report, Mr. Tinning. I do not think he had a written report.

Q. You don't think he had one?

A. He might have had some notes, but I certainly didn't notice any written report.

The Court: Where was this meeting?

A. This was the meeting in the office of the Tunnel, the Six Companies' Office.

(Testimony of Otto W. Peterson.)

Mr. Tinning: Q. That you arranged between Professor Derleth and Professor Sanborn?

A. I asked Professor Derleth to give Mr. Sanborn an opportunity to present some views that he wished to discuss with Professor Derleth, and that was the outcome of the interview. Mr. Sanborn was not reporting to me.

Q. You were an expert and you heard what he said, that is the fact I wanted evident, and you remember then that after he had stated the essential elements of his plan to Professor Derleth, he asked Professor Derleth what he, Professor Derleth, thought of the plan?

A. I think Professor Derleth expressed his views without being asked.

Q. You do not think Mr. Sanborn asked for them?

A. I don't know whether he did or not. But I know Professor Derleth expressed his views.

Q. Did Professor Derleth tell him at that time he did not think that Mr. Sanborn had gone far enough and that he thought that his plan was defective because he had not filled the holes completely with concrete?

A. That is correct. That is one thing that is correct. [1889]

Q. We agree on one thing. Do you remember visiting Professor Derleth's home on September 3, 1935, in the evening, with Mr. Henry Kaiser?

A. Well, I did not visit with Henry Kaiser.

(Testimony of Otto W. Peterson.)

When I was visiting with Professor Derleth Mr. Kaiser came in.

Q. You were both working for the Six Companies that night, weren't you?

A. Well, I presume so; he was one of the Six Companies; I don't know as he was working for them.

Q. Then Mr. Steve Behtel came in later?

A. No.

Q. This was just the evening before the Professor said what he thought about Professor Sanborn's plan?

A. It did not have any influence—I would not try to influence Professor Derleth.

Q. Do you remember on that occasion that Mr. Kaiser said that he wanted to discuss some method of expediting the authority from the P.W.A. and the State of California to secure a modification of the design?

A. No.

Q. You don't remember that?

A. No.

Q. Do you remember at the same time that Professor Derleth told you and Mr. Kaiser that the trouble with the tunnel was entirely due to not having proceeded promptly with the concreting after the excavation?

A. No, I don't remember that.

Q. You don't remember that?

A. No.

Q. Have you got any notes of these conferences?

A. Well, I may have some notes of my various conferences, but I don't recall any mention of those particular items.

(Testimony of Otto W. Peterson.)

Q. The book that you had with you this morning would show that? A. I have that book, yes.

Q. Is that your original memorandum book?

A. That has just a list of those specific dates that I made visits to the tunnels, and sometimes there are initials there of the persons that were at the tunnel at the time of my visit. [1890]

Q. I take it from your answer that is something that you have prepared to refresh your memory from from your original notes?

A. To serve as a guide from my original notes.

Q. And there is no reference in your note-book to your conference with Professor Derleth at which Mr. Kaiser and you and Professor Derleth were present on September 3, 1935?

A. Well, I may have a reference to that.

Q. Would you mind looking at your notes?

A. I will see if I have a reference in the diary that I have here.

The Court: What is the date?

Mr. Tinning: September 3.

A. September, 3, 1935. I do not know whether this book carries any particular notation about that. There is no mention of any conversation. I was at the office and various other places, and also I called at Professor Derleth's house, and I believe I did on that occasion ask him if he would see Mr. Sanborn. That is the only note that I have.

Q. When you were in college Professor Derleth was one of your professors, was he not?

A. He was.

(Testimony of Otto W. Peterson.)

Q. And you have been closely associated and friendly with him all of these years since you left college?

A. I have.

Q. And have visited at his home on occasions?

A. Yes.

Q. One of your first positions when you left college was with Mr. Lippincott, was it not?

A. Yes.

Q. You were also on terms of confidential relationship with him over many years, were you not?

A. Yes.

Q. And you also knew Mr. Van Norman, one of the District consultants, very well?

A. Yes.

Q. For many years?

A. Yes.

Q. When you entered into these negotiations and discussions looking toward a solution of the physical problem that you had at the tunnels, [1891] where you were representing the Six Companies, those negotiations were made on the basis of the relationship of confidence that existed between you and these other gentlemen?

A. Yes.

Mr. Smith: I submit that question is objectionable as to the basis of them. He testified what they were. That is not proper cross-examination.

The Court: He testified he was in school and there was a friendship going on for years, and social visits at home.

Mr. Smith: If there is an imputation in the question that he took any advantage of the relationship I think the question is objectionable.

(Testimony of Otto W. Peterson.)

The Court: I do not think there is. Frankly, I did not think about that. Proceed.

Mr. Tinning: Q. When these conferences were going on, Mr. Peterson, you never had in your mind in discussing these matters, in what was said between you engineers, in trying to solve this physical problem at the tunnel, that it was something later to be testified to in court, did you?

A. I had no such expectation whatever.

Q. So anything that was said by either of you back and forth in these discussions, it was not said with the expectation of being used as an admission against the party for whom such consultant was working at that time?

A. That is correct.

Q. I understood you to testify this morning in substance and effect that Mr. Lippincott told you in one of these conferences that he thought that the conditions which the contractor had met in this tunnel had been misrepresented to him?

A. That he made that statement?

Q. Yes.

A. No, I did not intend to convey that idea.

Q. You did not intend to make that statement?

A. No. [1892]

Q. You did not intend to make that statement?

A. No.

Q. So there can be nothing construed from anything that you testified here that Mr. Lippincott at any time in all of these negotiations said in substance and effect that he believed that the Six Com-

(Testimony of Otto W. Peterson.)

panies had been misled or that the conditions on this work had been misrepresented to them?

A. No. I might clarify that if you desire.

The Court: You may.

A. All we were endeavoring to do was work out this modification, and Mr. Lippincott's statement that I did not quite fully understand the situation, and I maintained that in doing this particular thing the contractor should not be required to waive any proper claims that he might have, and Mr. Lippincott said that the contractor had a perfect right to reserve such claims as he might have in the building of the tunnel, but he indicated no doubt as to the reasonableness of any claims that the contractor might then have, or later have, just a legal position that he spoke of, just a legal opinion from an engineer.

Mr. Tinning: Q. In other words, he recognized, as everybody else did, that the contractor had claims and he had a right to make them?

A. And reserve the right to present claims such as he might have, that is all.

Q. And whether or not the claims of the contractor were valid or not was not a matter of discussion? You were discussing the physical problem that confronted you? A. At that time, yes.

Q. Did you ever discuss with Mr. Lippincott, and I mean now in these conferences at any time discuss with Mr. Lippincott whether or not he believed that Six Companies had——

A. (Interrupting) No, I did not try to press

(Testimony of Otto W. Peterson.)

anything like that on Mr. Lippincott or anybody else. All that I endeavored to do was to suggest [1893] that such claims as the contractor might have be reviewed in arbitration, if possible, rather than being carried into court.

Q. That was another matter and you took that up directly with the District? A. Yes.

Q. When you spoke about the desired, hurried lining decision in September, when you took hold of this thing, did you have in mind the proposed dropping of the section 10 inches?

A. Not immediately. I didn't know what the solution would be. I had no definite plan in mind at that time.

Q. I understood that you desired to get a decision promptly from the District Engineer?

A. By the 10th of September, I felt that that was the proper thing to do, very definitely.

Q. You knew in your talks with Mr. Boggs that it would be necessary to secure the approval from the State and P.W.A. to such modification?

A. Mr. Boggs informed me of that, that he would have to consult them.

Q. In working that design out did you give consideration to the fact that by dropping the top of the tunnel 10 inches, as was actually done, and bringing in the walls six inches, as was actually done, that 10 per cent. of the designed area for the air ducts in the tunnel was cut off?

A. I knew there would be some reduction provided the same roadway space was held, but there

(Testimony of Otto W. Peterson.)

were various ways in which that change could be accomplished. That was the particular solution which the district decided to make.

Q. So that there was 10 per cent. of the area——

A. (Interrupting) I did not consider that of any moment.

Q. Just a moment, let me finish, so that there was actually, under the modified design that was authorized, after the Industrial Accident Commission letter of September 24, 1935—the area in the air ducts was cut, where you had a modified section, was cut [1894] down 10 per cent.?

A. I don't know what that amount was, Mr. Tinning.

Q. You do not quarrel with that, do you?

A. I do not think it is a serious matter, myself. I thought the air duct space was rather ample. I think it would have been a little cheaper project.

Q. You are volunteering now, passing on some other engineering work.

A. That was caused by this particular comment.

Q. Do you know that the cutting down of the air ducts has cut down the capacity for air to be driven through those ducts 5 per cent.?

A. No.

Q. Do you know that during the discussion that the P.W.A. engineers requested the District to require the contractor to pay the capitalized value on that cost?

A. Some other solution that would have been

(Testimony of Otto W. Peterson.)

more favorable to the District might have been worked out under those conditions.

Q. You have in mind at the time this was being worked out, do you, the exhibits in this case, the letter of Six Companies, Exhibit OO, in which they offered to do certain things on September 1, 1935, in connection with the safety of the tunnel, the trimming of timbers, completing the concrete lining in the unlined portions of the excavated tunnels with a crown height 6 inches lower than the crest of the present theoretical crown height?

A. No, I do not have that in mind.

Q. You do not have that in mind?

A. No. That was the preliminary plan we were all working on, and later went on to a plan which we realized was a better and more proper plan, as regards the amount that the arch should drop.

Q. Defendant's Exhibit OO, offering to do this work, contained no clause with respect to any claims or reservation of rights by Six Companies, but Defendant's Exhibit PP, a letter of September 3, 1935, written at the very time that you were negotiating and dis- [1895] cussing these matters with Professor Derleth and Mr. Lippincott and Mr. Boggs, stated,

"Under date of September 1st, we wrote you a letter concerning changes in plans and specifications for concrete lining of the excavated portion of the Broadway Tunnels. By this letter we advise you that our letter of September 1st, above mentioned, was written and shall be con-

(Testimony of Otto W. Peterson.)

sidered by you subject only to the following further conditions:

"1. That in making the suggestions contained therein, we assume no responsibility or liability of any kind or character for any design suggested by us or the safety thereof, in the event you direct us to carry out the things stated in our letter."

A. Yes.

Q. Then:

"That we reaffirm and state our position to be as stated in our letters to the Board of Directors of your District dated, respectively, August 23rd and August 28th, 1935."

You knew about those letters?

A. I think those letters were written by an attorney.

Q. Yes, I think so.

A. That particular letter.

Q. Would you like to change the design of those letters?

A. This is purely a preliminary effort to arrive at a solution of this problem, just like other things were, and we finally arrived at a good plan; we were all impatient to get something decided, and this was a preliminary and probably a useful step in seeking that conclusion.

Q. In developing the crystallization. A. Yes.

Q. You have in mind the District letter of September 5, I think, Mr. Peterson, "You are advised

(Testimony of Otto W. Peterson.)

to cease and desist" pouring tunnel concrete in the forms which you were proposing to cut down?

A. I remember that.

Q. Will you answer the question, do you remember the letter? [1896]

A. Yes, I do.

Q. And it was a fact, was it not, that you stopped the effort to pour the tunnel lining on the unauthorized section after you received this letter?

A. Yes, I did.

Q. Then you remember another letter of September 5, Defendant's Exhibit QQ, in which the Secretary of the District advised Six Companies that the District considered that it was the duty of the Six Companies to proceed to construct the tunnel in accordance with the plans and specifications?

A. Yes, we decided we would do that at one time.

Q. And that was at the same time or one day after you were up talking to Professor Derleth with Mr. Sanborn about trying to change the design?

A. I was not trying to change the design at any time.

Q. You entertained ideas that it was advisable?

A. I did, personally. You asked me my personal views, but otherwise I would not have expressed them. I was suggesting my own personal view, and I did not advertise it, I did not write any letters about it; I have never written a letter or made any expression in that regard.

Q. During that time, the early week of September, all of the time Six Companies was placing con-

(Testimony of Otto W. Peterson.)

crete in the portions of the tunnel where you could do so to standard sections? A. Yes.

Q. How many feet of steel forms did you have in the tunnel at that time?

A. What time, Mr. Tinning?

Q. On September 5.

A. I don't know the exact footage.

Q. Well, approximately.

A. I should judge we had about four forms, I don't know the exact number of lineal feet.

Q. Weren't there two forms of 27 feet in length and was not one of them cut down in half?

A. I am not positive about that.

Q. There were four 18-foot forms, were there not? A. I think that is correct. [1897]

Q. You were using all of those, were you not, during that period in the tunnel, placing concrete?

A. As effectively as possible.

Q. So you were not delayed during that period in placing concrete by the difficulty of working out this modified section?

A. We were working to a very limited capacity, that was just a start.

Q. You only had those four 18-foot sections?

A. At that particular time, but we had plenty of work in which we could use similar forms.

Q. How long would it take to get additional forms?

A. We could get additional forms, or if the ground was better we could have moved very much faster; it was a very restricted operation.

(Testimony of Otto W. Peterson.)

Q. Mr. Peterson, let us get right to the matter. You had four 18-foot forms and you used them all through this period, did you not, pouring?

A. Yes.

Q. How were you delayed in pouring this concrete lining by the delay of the district in giving you authority to pour the modified section?

A. We were not delayed in that very restricted area, but it was because of the way in which we could work, it was so restricted that we were delayed on the job as a whole.

Q. What did the District have to do with the timbers being in the tunnel?

A. I don't know, unless, I think certainly the contractor was not responsible for the ground encountered as much as the owner.

Q. That is your opinion. The District did not put the ground there, did it?

A. They selected the site and they made the representation.

Q. And they made a bad job of it?

A. No, I do not criticize the selection of the site. I am not critical of the design or the geology. [1898]

Mr. Tinning: That is all.

The Court: We will take a recess for a few minutes.

(After recess:)

Mr. Tinning: No further questions. [1899]

Mr. Smith: Just a few more questions, your Honor, on redirect.

(Testimony of Otto W. Peterson.)

Redirect Examination

Mr. Smith: Q. You spoke of the Yerba Buena Tunnel being a different type of tunnel from the Broadway Tunnel. In what sense did you use the word "type" when you said that?

A. That is a wide tunnel,—wide between the sides; some 70 feet wide, from spring line to spring line across the width of the tunnel.

Q. Where does the spring line occur, approximately; the wall plate line in most tunnels?

A. Well, about what would be the wall plate line in most tunnels.

Q. Well, you are referring, then, to the width of the tunnel at that point where the wall plate line would be in the Broadway Tunnel?

A. In a tunnel of that size.

Q. Where do you differentiate the two types you speak of as being very wide and those being wider in the same type?

A. Well, generally, I would say tunnels up to 35 feet wide are in one type,—that is, tunnels from 20 to 35 are in one class,—large tunnels; and the tunnels of over 35 feet and particularly over 40 and over 70 are very broad tunnels,—tunnels of great magnitude; in fact, Yerba Buena Tunnel has the biggest cross section of any tunnel in the world, so far as I know. It is a very, very different tunnel from the Broadway Tunnel.

Q. How large is the Broadway at that point that you mentioned between the wall plates?

A. 33 feet.

(Testimony of Otto W. Peterson.)

Q. How wide is the Sunset Tunnel at that point?

A. 30½ feet.

Q. How wide are some of the vehicular or highway tunnels that you know of at that point?

A. The Stockton Street Tunnel is about 55 feet wide. The Richmond Vehicular Tunnel is 41 feet wide. The Figueroa Street Tunnel is approximately 50 feet wide between the steel or timbered supports at the outside of the excavation. In [1900] other words, about 50 feet wide. In other words, the Twin Peaks Tunnel, the Sunset Tunnel and the Pit Three Tunnel and the Broadway Tunnel are all large tunnels; but they are tunnels that are of the type that would be excavated,—fully excavated,—before concreted. A tunnel such as Stockton Street Tunnel, Richmond, Figueroa and Yerba Buena are of the very broad type, where it is not practicable or feasible or safe to support them with segmental arches without support on the core; and, for that reason, the core must be left in. Those are very different type tunnels. Also, most of them have a flat arch, which is flatter than the semicircular type.

Q. That differentiation, then, is in tunnels of much greater width than the approximate 30 to 35 foot width?

A. Yes; and it is a different type entirely,—different type of construction.

Q. At the Sunset Tunnel, or Duboce Tunnel, did you keep behind the excavation several thousand feet?

A. We started concreting about 5 months after

(Testimony of Otto W. Peterson.)

the excavation of the core, starting at the east portal.

Q. How much of that tunnel was excavated from the east portal?

A. 3000 feet of that tunnel was excavated from the east portal; that is, of the core; and about 1200 feet of the core was excavated from the west portal.

Q. Where was it concreted from?

A. Well, all of the concreting was done from the east portal.

Q. How long were the sections that were excavated from the west portal open; how long had they been open at the time that it was concreted from the east portal?

A. About 9 months.

Q. How long was that section that was excavated at the west portal?

A. 1200 feet.

Mr. Smith: 1200 feet. I think that is all.

The Court: Is that all of this witness?

Mr. Tinning: That is all.

The Court: We will take an adjournment until tomorrow morning at ten o'clock. [1901]

(An adjournment was here taken until tomorrow, Friday, May 27, 1938, at ten o'clock a. m.) [1902]

Friday, May 27, 1938;

10 O'Clock A. M.

GEORGE T. SLOAN,

called by the plaintiff; sworn.

Direct Examination

Mr. Smith: Q. Mr. Sloan, where do you reside?

A. Oakland, California.

Q. What is your address?

A. 5616 Kales Avenue.

Q. What is your occupation?

A. I am bookkeeper for the Six Companies. I believe I would have the title as of office manager, probably.

Q. When were you employed by Six Companies of California, the plaintiff in this action?

A. June 19, 1934.

Q. Have you been employed by them since that time?

A. Continuously.

Q. What were your duties?

A. Originally, just the disbursing of funds for payrolls and for supplies, and adjusting costs, and reporting to stockholders as to the various figures; after February 1, 1935, I took on the duty of purchasing agent along with my former duties and have been, you might say, office manager.

Q. Did you cause to be kept, yourself or under your supervision, a record of the costs of the plaintiff Six Companies of California in connection with its performance of the contract involved in this case

(Testimony of George T. Sloan.)

with the Joint Highway District? A. I did.

Q. Have you prepared a summary of the costs kept by you,—the costs incurred by the plaintiff in this action? A. I have.

Q. I show you a document entitled "Costs Adjusted to September 30, 1937; Construction Costs as of June 13, 1936," entitled in this case, and ask you if that is the document you refer to.

A. Yes, that is it.

Mr. Smith: We offer this in evidence, if it please the Court, as a summary of the true costs incurred by the plaintiff in this case, [1903] in connection with its performance of the contract involved in the action.

The Court: What do they total?

Mr. Smith: Q. Will you explain to the Court?

A. I would be glad to.

Mr. Wittschen: That is what I was going to object to, if your Honor please, on the ground that on the issue of their right to rescind this matter would be immaterial. I do not argue that it would not be material on the main case, but I would like to call your Honor's attention that until such time as the plaintiff has proven its right to rescind, the matter of costs would be immaterial. I venture that Mr. Smith will state,—because we have discussed this matter privately,—that he merely intends to introduce the summary; and then, in the event your Honor holds that they had a right to rescind, at some future date we could examine it and cross-examine.

(Testimony of George T. Sloan.)

On the other hand, if your Honor holds they have no right to rescind, then this would be immaterial. If it comes in, we ought to cross-examine on it, and it would obviously take some days. We would have to look it over, and we dispute very materially costs. If you will recall, at the beginning of the trial we had a suggestion that we confine the preliminary trial to the right to rescind. There is ample precedent for that, your Honor. Your Honor, I am told, in admiralty cases, where you determine liability and then, later, damages, that is the practice. In a very recent case,—I think it was decided within the month,—in Southern California, where the contractor had a disagreement with the Metropolitan Water District upon one of these matters and the District ordered the contractor off the work, it was the converse of ours; but the legal principle is the same; Judge Yankwich there decided that the District had a right to order them off, and, having decided that issue in the District's favor, no evidence [1904] was received in regard to damages, and the case terminated without any determination as to damages; and I am now moving the Court, as part of my objection, that the proof which the plaintiff presents will be limited to the issue of its right to rescind the contract and that any issue as to damages be postponed until the Court has passed upon that issue.

Mr. Smith: Well, we offer the summary of the costs upon the theory, your Honor, as part of our case in chief, for the purpose of proving, as of

(Testimony of George T. Sloan.)

necessity we must, the exact amount which was disbursed in connection with the contract and its performance by the plaintiff, and also for the purpose of showing and establishing that the cost incurred was greatly in excess of the amount which was involved in the original contract, as proof tending to show the contract was vastly different from the contract which the parties executed. However, Mr. Wittschen has made a correct statement of the discussion which we had prior to offering the evidence in question, and that statement is satisfactory to us.

The Court: Are you in accord with his legal position, namely, up to the point where I have to determine whether you were justified in walking off the work?

Mr. Smith: Well, I think your Honor first has to determine the issue that the plaintiff has the right to rescind on the theory——

The Court: Of the right to rescind.

Mr. Smith: Yes.

The Court: For that limited purpose, I will allow it to come in.

Mr. Wittschen: I don't quite understand its purpose, because it does not prove anything on the right to rescind.

The Court: Well, read the statement of counsel.

Mr. Wittschen: He stated the cost was excessive.

The Court: The cost was excessive. [1905]

Mr. Wittschen: Yes; and I take it that the evidence to date has shown that the Contractor's claim

(Testimony of George T. Sloan.)

to be,—and he has put in proof,—that he had to excavate more dirt.

The Court: I had in mind the amount; that was all.

Mr. Wittschen: Yes.

Mr. Smith: That is the extent of the offer.

Mr. Wittschen: I take it the amount would be immaterial.

The Court: I will give you a record on the amount. What is the total?

Mr. Wittschen: Note an exception, please.

The Witness: Just the total amount, or the total cost?

Mr. Smith: Q. The total costs, yes.

A. Well, I thought you might want to explain that to the Court.

Mr. Wittschen: If you put the document in, as Mr. Tinning suggests to me, we will have to cross-examine. The Court has stated he would permit you to establish a total cost.

The Court: I said that, of course, as it was only for the record, since he agreed to the legal view, namely, as to whether we would dispose of this matter of rescinding the contract——

Mr. Wittschen: Yes; I appreciate that.

The Witness: We have two figures.

The Court: Q. Well, give them to us.

A. A figure of total costs before any adjustments, \$3,872——

(Testimony of George T. Sloan.)

Mr. Smith: Q. That is, after crediting payments?

A. No; that is before: \$3,872,168.86. Then we have drawn up an adjustment figure which takes into account any rentals of plants, or sales of equipment, and so forth, which results in a net credit adjustment of \$43,170.02; that leaves a figure that we call adjusted costs, \$3,828,998.84.

Mr. Wittschen: May we have an understanding and stipulation [1906] with counsel that these figures being in we need not, at this time, cross-examine on the reasonable costs that you have put in, which you claim to be reasonable costs; and, in the event the Court decides that you have a right to rescind, that then we may go into that matter at a later date?

Mr. Smith: That is satisfactory.

The Court: The record will so show.

Mr. Smith: That becomes plaintiff's exhibit what, Mr. Clerk?

Mr. Wittschen: I did not think the document was in. The document, as I understand it,—the details you put in were total costs; you have a contract price, so the Court can get the difference.

The Court: Yes.

Mr. Smith: That is all.

Plaintiff rests. [1907]

Mr. Wittschen: In order that your Honor may understand our position, it is our purpose to call just one or two witnesses on the issue of the right to rescind. We will call perhaps two witnesses, not to exceed that, and then submit that issue to your Honor on the merits, rather than move at this time for a nonsuit, because we prefer you to pass on the merits, and we will confine our proof to that particular issue. Then after the Court has indicated its ruling upon that issue such other steps will be taken as may be proper. If the ruling is in our favor we will then proceed to put in our proof as to the damages. Before, however, putting on our case there are certain motions relative to striking out certain exhibits which were reserved which I would like to make at this time.

Defendant moves first that there be stricken from the record in this case certain evidence introduced during the trial of the cause, namely:

(a) Plaintiff's Exhibit No. 22, the so-called Geological Report, and all testimony of the witness Larson and any other witness with reference to the reliance of such witness upon the statements of such report, particularly the statement of any witness that such witness relied upon such report in forming a conclusion that the ground through which the tunnel was to be driven would be self-supporting, and any reference that the bid of the plaintiff was based in whole or in part upon reliance upon such report.

(b) Plaintiff's Exhibit 23, map or chart copied from a map or chart on such Exhibit 22, and all testimony of any witness with reference to the same or that such witness relied upon such map or chart in forming any conclusion as to underground conditions or as a basis for the bid of plaintiff.

Said motion is made and based on the ground that the same is [1908] wholly incompetent and immaterial, and on the further ground that the Geological Report and any maps thereto attached are expressly excluded from consideration as a part of the contract, and by the introduction of said report and map plaintiff is attempting to vary the terms of the written agreement between the parties.

The grounds above stated apply to each of the motions above referred to.

I do not desire at this time to argue that matter, unless your Honor desires. I think we are correct in our legal position and it is all covered in the Points and Authorities which I have handed to your Honor.

The Court: You submit the motion?

Mr. Wittschen: Yes, your Honor.

Mr. Marrin: If your Honor please, it is our position that the Geological Report and the testimony with respect to reliance thereon, and all of the information which has been furnished by the defendant to the plaintiff is relevant and material and admissible in this case upon the following grounds:

1. There is in this case the issue raised of fraud, constructive fraud, and mutual mistake, and the

plaintiff in connection with that is entitled to show any representations which were made to it as an inducement to enter into the contract. It does not make any difference whether those matters are part of the contract at all, as it is clearly held by the authorities that on such issues any matter of inducement leading a party to enter into a contract is clearly admissible.

In the case of *Ferguson v. Koch*, 204 Cal. 342, the Supreme Court of this State said on this issue:

“Parole evidence is always admissible to prove fraud, and it was never intended that the parole evidence rule should be [1909] used as a shield to prevent the proof of fraud. Hence, the fact that the sale of an automobile is evidenced by a written contract will not prevent the purchaser from proving by parole evidence that the sale was induced by fraud. And this is true, even though the contract recites that all conditions and representations are embodied therein. There is no such sanctity surrounding a writing that parties may not be permitted to go back of it and show that there was such fraud practiced in the procurement of the same as to vitiate the writing. The law never countenanced a rule which would deny to one the right to prove that fraud had been practiced upon him. In actions for rescission on the ground of fraud the statutory provisions that when the terms of an agreement have been reduced to writing such writing is to be considered as containing all the

terms, and that the execution of a contract supersedes all prior negotiations or stipulations, have no application and do not control. Appellant has cited us to certain earlier cases in our reports which he claims make a distinction between fraudulent representations going to induce the making of a contract and representations in the nature of warranties. There is no reason why any such distinction should exist, and, in fact, none does exist."

Now, in the line of Federal cases, also, if your Honor please, which we have cited in our opening brief, there are a number of cases where judgment was rendered in favor of the plaintiff contractor because of representations which had been made in drawings and borings which were outside of the contract but which were referred to and relied upon by the bidders in making their bid.

In the case of Passaic Valley Sewerage Commissioners v. Holbrook, Cabot & Rollins Corporation, the reference was to certain drawings purporting to set forth the result of certain borings, and [1910] there was no question but that those borings were admitted in evidence in that case, but the judgment turned on the fact that the borings which were not a part of the contract did not show the true conditions. Also in that case there was attached to the drawings the following note:

"The borings, soundings contour lines, profile, and indications of rock outcroppings, sub-

surface materials, pipes and other underground structures are supposed to be approximately correct, but should they be found to be otherwise the contractor shall have no claim on that account, it being expressly understood that the Commissioners do not warrant the plot to be approximately correct."

In reply to that, in replying to the contention of the defendant that because of such statement in the contract the defendant was not bound by the result shown on the map or on the drawing which purported to show what the results of the borings were, that court reviewed certain prior decisions of the United States Supreme Court as to the effect of the self-exonerating clause, and in that decision the Court said:

"The last case on the subject, and one containing facts which resemble closely those of the instant case, is *United States v. Atlantic Dredging Co.*, where the self-exonerating clause in the contract there in question was similar to and just as strong as the clause here in question. In that case the Supreme Court, citing its previous decisions, announced the law that, when a governmental body has asked for bids for excavation work and has represented the condition of the material to be excavated, and in its representations had misstated facts, or has failed to state facts, within its knowledge, it cannot escape responsibility by a clause of

the contract in which it required bidders to examine the work for themselves and in which it said that its statements of facts were but expressions [1911] of its opinion and that it did not guarantee them. This, in effect, was a holding that representations made in such circumstances import a warranty, and also that, in consonance with familiar law, a person cannot contract against his own fraud."

The Court: For your comfort I will adopt that as the law for all purposes of this case.

Mr. Marrin: Yes, I would like to have you do so.

The Court: I will without any hesitancy.

Mr. Marrin: There is another point on which we think this evidence is admissible, if your Honor please, and that is on the question of extension of time. We have shown in this case that before entering into this contract the plaintiff made all of the examinations which it could reasonably be expected to make to determine the nature of the ground through which these tunnels would be constructed. As a part of the examination which the plaintiff made and as showing the diligence with which it went into the matter, it procured a copy of and studied the geological report which was prepared by the District and which was mentioned in the specifications, in addition to doing other things, such as specifically examining the ground, examining the test pit and other matters of that kind. Now, if the plaintiff has done everything reasonably possible to

attempt to ascertain the character of the ground here and the plaintiff was not able to, by such examination, determine the character of the ground, then that is part of the proof that the plaintiff was unavoidably delayed in driving the tunnels, and we also think that this evidence is admissible upon that proposition; whether or not the Court finds that the defendant in this case has been guilty of fraud or guilty of mistake, or whatever the decision of the Court may be, nevertheless the documents, themselves, are admissible as evidence tending to prove those facts. And upon [1912] those grounds we submit, if your Honor please, that this evidence which the defendant has moved to strike out should be left in the record.

The Court: As to constructive fraud I take it that is the geologist's report, for that reason your clients were misled?

Mr. Marrin: Yes.

The Court: What, if any other fraud?

Mr. Marrin: The geologist's report and the provisions of the specifications we contend led this plaintiff to believe before submitting its bid that the ground through which these tunnels were to be constructed would be self-supporting ground, which would permit of a certain method of construction.

The Court: I am just trying to crystallize the problem that I have to determine, namely, self-supporting ground and the geologist's report. Now, that is what we are discussing as to constructive fraud.

Mr. Marrin: And the specifications.

The Court: The specifications in what respect?

Mr. Marrin: In respect to the removal of timbers.

The Court: Removal of timbers. Have you anything else in mind?

Mr. Marrin: No, we have nothing else in mind than those matters.

The Court: Very well, that is clear. Now, with relation to your motion, does the matter stand submitted?

Mr. Wittschen: Yes. Does your Honor care to hear argument?

The Court: No.

CHARLES DERLETH, JR.

Called for the Defendant; sworn.

The Court: Professor, I have never had the pleasure of meeting you before, but I have observed you in court. Do you see the [1913] trouble that you have made in this Court by producing men in years gone by? A. I hope you will forgive me.

Q. However, you will feel comfortable and feel at ease.

A. I shall not do it very much longer.

Q. Some of them do not agree with you though all of them have profound respect for you.

A. They are very generous.

Mr. Tinning: Q. Professor Derleth, you were employed as a consultant by the District before any

(Testimony of Charles Derleth, Jr.)

plans were drawn for the project by the District, were you not?

A. Yes, I have been associated with the project from the very beginning.

Q. Were you present at a conversation held on or about the 21st of May, 1935, near the west portal of the tunnel, at which S. D. Bechtel, Mr. T. M. Price and District Engineer W. B. Boggs were present? A. I was.

Q. Will you state what, in substance and effect, was stated at that conversation?

A. Well, I had been in the tunnel during the morning with Mr. Boggs and sometime between 11 a. m. and 12 noon we came out from the west portal and were walking toward the offices of the Six Companies, and very close to the steps leading to their office, with Mr. Boggs, I met Mr. Stephen Bechtel and Mr. Price and I took at that time occasion to say to them that I was concerned that they were not proceeding promptly with the lining to follow the excavation in the two bores, that I thought it was a hazard not to proceed.

Q. What did you mean by the lining?

A. I meant the reinforced concrete lining in the horseshoe-shaped portion of the sides and the roof, the archway, of the excavation.

Q. Did you at that conversation hear anything said with respect to an extension of time?

A. No, I think not.

Q. Did you leave before Mr. Boggs?

(Testimony of Charles Derleth, Jr.)

A. I left shortly before noon, [1914] because it was my intention that morning to examine some of the approach structures, the concrete approaches on the Oakland end.

Q. When you left did you leave Mr. Boggs there with Mr. Bechtel and Mr. Price?

A. Yes, Mr. Boggs excused himself from me and I think I went with Mr. Barkley or Mr. Gelston—I left Mr. Boggs with Mr. Bechtel and Mr. Price.

Q. Do you know Mr. De Lancey Smith, one of the attorneys for the plaintiff in this case?

A. Yes, I know him very well.

Q. Did you know him in 1935?

A. Yes, we met frequently for many reasons.

Q. In connection with the Broadway Tunnel matters, or in connection with other matters?

A. I think it was about that time that we also met on questions concerning the Golden Gate Bridge.

Q. Did you meet with him respecting the Broadway Low Level Tunnel?

A. Well, Mr. Smith and I often meet while going to the City, we used to get on the Key Route train at Webster street and Claremont, or adjacent stations from Berkeley on usually Mondays or Wednesdays, when I was going to the City, Mondays to the Bay Bridge and Wednesdays to the Golden Gate Bridge, and we were friends, we used to talk together.

Q. Did you have a conversation with Mr. De Lancey Smith on June 15, 1935, and, if so, where did it occur?

(Testimony of Charles Derleth, Jr.)

A. At between 8 and 9 o'clock in the morning I boarded the Key Route Claremont train at Webster street and Claremont Avenue in Berkeley and Mr. Smith either was on the train or got on at that same station, and he came to me and he spoke to me about some of the problems that were worrying the contractor.

Q. When you refer to the contractor you refer to the Six Companies?

A. The Six Companies.

Q. Was there anyone else present at that conversation between Mr. Smith and yourself?

A. No, there was no one intended to be [1915] present; there were other people, of course, sitting nearby in the train or on the ferry boat.

Q. Now, will you state in substance and effect what Mr. Smith said to you and what you said to Mr. Smith respecting anything in connection with the Broadway low-level tunnel?

A. It is my clear recollection that Mr. De Lancey Smith told me that they felt that Mr. Boggs was not sufficiently cooperating with them on two counts, one that they wanted extensions of time, and the other that in their judgment he was not giving them sufficient engineering or lines and grades for the excavation of the two bores of the tunnel, and that he felt that something ought to be done whereby Mr. Boggs would be more cooperative.

Q. Did he state to you in that conversation that Mr. Boggs had promised an extension of time to the Six Companies?

(Testimony of Charles Derleth, Jr.)

A. No, it was my impression from that conversation that he hoped he would do so, and I thought, because of my friendship with the contractors, I assume that is clear, that I always wanted to help a contractor in his difficulties, that in my capacity as a consulting engineer I would do whatever was just to them and to the owner, in accordance with the contract and the specifications and plans.

Mr. Tinning: You may cross-examine.

Cross Examination

Mr. Marrin: Q. Mr. Derleth, you say that this conversation occurred on May 1, 1935?

A. The first conversation occurred near noon on May 21.

Q. May 21? A. May 21, 1935.

Q. And you had been in the tunnel with Mr. Boggs during the morning? A. Yes.

Q. When you came out you met Mr. S. D. Bechtel and Mr. Price at the [1916] steps of the job office?

A. That is correct.

Q. That was about eleven o'clock?

A. It was near noon, I think.

Q. Near noon? A. About 11:30, say.

Q. To whom did you make the statement that you were concerned about the concrete not proceeding?

A. The statement was intended to be made directly to Mr. Stephen Bechtel, who was the presi-

(Testimony of Charles Derleth, Jr.)

dent of the company, and Mr. Price was present, and heard what I said.

Q. Did you ever talk to either Mr. Bechtel or Mr. Price about this subject at any other time?

A. Yes, I think so; I began to think seriously about this question as early as, we will say, the 10th of March, 1935.

Q. I am not asking you when you thought about it, I am asking when you said anything to Mr. Bechtel or Mr. Price, and if you did will you please state the place, and who was present, and what was said?

A. Beginning in October, 1934, I made frequent visits to the tunnel.

Q. Will you just confine yourself, Professor Derleth, to answering the question I have asked you, and state any statement that you made to Mr. Bechtel or Mr. Price about keeping the concrete up?

A. All right, sir. Well, then, in February, and March, and in April, I met Mr. Price at least twice every month in the tunnel and he used to ask me frequently, particularly beginning in April, when would they get into better ground, and in those conversations I used to usually say, "I think you will get into much better ground in the cherts, and when are you going to begin the concrete lining?"

Q. That was the extent of the conversation?

A. Usually; we were very good friends, and I hope we are still. We always used to joke together.

Q. Why did you think they would get into better ground in the cherts?

(Testimony of Charles Derleth, Jr.)

A. In the months from October to, say, December, 1934, they had had soft ground in the portal, and it was their obvious hope to go to [1917] the full faced excavation, and as they proceeded through the Monterey sandstone they did finally get into much better ground, when they had more overburden, and they were approaching into the cherts, and it was my judgment and it has been settled in my own mind I was right, that they would reach better ground in the cherts, very much better ground.

Q. You stated you thought you had this conversation with Mr. Price in February of 1935. Do you recall how much ground was excavated in each tunnel in February, 1935?

A. My previous answer stated that the impression—when I stated we started in April, that I had begun to talk with him about the excavation in February.

Q. You did not have any particular comment on the concrete up till April, 1935?

A. No, I did not expect them to do the impossible, although you will recall that much earlier the construction program of the contractors had definitely stipulated that it was their intention to not be much more than six weeks at the most behind the excavation with their concrete.

Q. Which construction program are you referring to now, Professor?

A. There are two.

Q. Which two do you refer to?

A. Just a moment. I made a memorandum from my daily records of these dates. I understand you

(Testimony of Charles Derleth, Jr.)

have already in evidence Exhibit N, which was the Six Companies' construction schedule of August 9, 1934; you proposed to start excavation on July 15, 1934 and your schedule shows that you intended to begin the concrete lining following the excavation on September 4, 1934, an interval, say, of six weeks; and the second schedule is Exhibit O, where you modified that program, dated February 12, 1935, and you extended your time particularly for completion.

Q. Now, I show you, Professor—I assume I may use our copy of the exhibit—a copy of Defendant's Exhibit O, which has been offered in [1918] evidence.

The Court: That was the last one?

Mr. Marrin: That was the one that was presented in February, 1935. I should like to ask you, Professor, after Exhibit N, the construction schedule of August, 1934, was given to the District, difficulties developed at the west portal, did they not?

A. Well, yes, if you call them difficulties.

Q. And the excavation in December of 1934 was obviously far behind what was projected on the construction schedule in August, 1934?

A. Yes. You were working on the excavation for a ventilating building instead of going into the tunnel.

Q. In December, 1934?

A. You started in October, 1934 and you went into the tunnel, in the portal in those last months of

(Testimony of Charles Derleth, Jr.)

1934, but you started your contract in July or June preceding; you were working all of that time, not on the tunnel, but on the area for the ventilating building. You were losing time there.

Q. You did not answer my question. What was the status and condition of the tunnel on December 5 of 1934?

A. Well, you had hardly started on the tunnels, you were working on the approach of the tunnels.

Q. As a matter of fact, Professor, the south tunnel had been excavated and concreted a distance of 92 feet, had it not?

A. Yes, about 100 feet.

Q. 92 feet, and the north tunnel had been excavated and concreted a distance of 110 feet?

A. That is about right, 100 feet.

Q. And the excavation was not ahead of the concrete at any point in the tunnels on that date?

A. Of course not, that is correct.

Q. So that obviously by that time the construction schedule, Exhibit N, could have no application, and the intention of the contractor as to the distance he was going to keep the concrete ahead of the [1919] excavation would have no bearing on the situation as it then existed?

A. That is true, but your construction schedule was in August, and at that time you were working on the ventilating building, and apparently it would seem to me you were changing your plan. That is all right. Therefore, later, when you did delay be-

(Testimony of Charles Derleth, Jr.)

tween July, 1934 till December, 1934 with prosecuting the tunnel excavation, you naturally changed your program. That is all right.

Q. That is your conclusion, that we delayed. However, I am simply bringing out the situation.

A. I did not say you delayed, but you changed the program. You had six months in which nothing was done in excavating the tunnel.

Q. Very well. Now, the next construction schedule was Exhibit O, which was submitted——

A. In February.

Q. In February. A. 1935.

Q. Will you point out on that construction schedule, Professor, the date upon which it says concrete lining was to start in the walls and arch.

A. Here, this one, May 1, 1935. That is correct.

[1920]

Mr. Marrin: Q. The excavation was resumed in the tunnel about the first part of December of 1934, was it not? A. Yes.

Q. So, the period shown on that construction schedule, the difference between the time of the commencement of the excavation and the time when it was contemplated the concrete lining would start, was a period of 5 months and not of 6 weeks; isn't that correct?

A. Yes, that is all true; but you could not even begin your concrete lining; you did not have the concrete equipment in your bunkers until July 1, 1935.

Q. That may be true; but you mentioned a while

(Testimony of Charles Derleth, Jr.)

ago the time schedule which showed that the Contractor contemplated keeping the concreting up within six weeks of the excavations?

Mr. Wittschen: He was speaking of the other one.

A. That is from the schedule "N," I think. The fact is, to be explicit, that in the early part of your work, starting, say, with July, to December, 1934, it was a general understanding between the Contractor and the Engineer of the owner that you were going to keep your concrete lining promptly back of your excavation.

Mr. Marrin; Q. As a matter of fact, that was the plan of the Contractor to keep the concrete line up within about 300 feet of the face of the excavation?

A. Yes, that is correct, for the Contractor himself, I said, intended to keep his lining close to his excavation; but he never did it; and so, on May 21, 1935, I took it upon myself, as a friend, to say to Mr. Stephen Bechtel, as has already been testified, that I was becoming concerned that the linings were not being placed, and you were leaving the large bores of the tunnel open with just the timber holding the material.

Mr. Marrin: No further questions.

Mr. Tinning: Thank you, Professor.

The Court: They were not near as severe on you as I thought they would be. [1921]

The Witness: Well, I thank them and I thank you.